Connecting the Past, Present, and Future of East Central Indiana:

Nature and Culture Connect Us All

A CREATIVE PROJECT

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Abstract

CREATIVE PROJECT: Connecting the Past, Present, and Future of East Central Indiana: Nature and Culture Connect Us All

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Students and teachers in East Central Indiana lack educational curricula that feature natural and cultural concept that are specific to the region. Curricula that will allow students to learn about the environment, nature, and ethnohistory of the area in which they live. There has been previous work creating environmental education lessons for Indiana; many of them give broad information or are written for areas of Indiana that are not specific to East Central Indiana. Research suggests that younger students, who are learning the educational themes of environment, culture, and nature, relate better if the places they are learning about are near them. According to a myriad of examples in environmental education literature, it is important that students learn about what is happening in and around their immediate surroundings. Students need to feel like they can connect to the place they live. Through interview, direct observation, and work in the field, I developed three place-based environmental education lesson packets that

address these issues. The three lesson areas I cover focus on: Reconnecting- to place and fostering a sense of stewardship in local green spaces; interconnecting- learning with specific context about native people that were/are in the area; and positive examples- pointing out not just the negatives of environmental issues like species loss but focusing on species revitalization projects. Through investigative research, I have discussed factors affecting nature-deficit disorder, educational constraints to providing students with nature- based education lessons, culminating in place-based nature education lessons specific to students in grades three through five in East Central Indiana.

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Introduction:

As a child raised during the 1980's, I am among the last decade of children to experience a childhood that was connected to the outdoors more so than to electronic gadgetry, a sentiment shared by many of my fellow high school graduates and several others I have spoken to during the course of this project. Climbing trees, riding bikes beyond range of one's parents, and simply wanting to be outside resonated with many children of the 1980's. As I research and compare my childhood with those during the 2000's and into today, 2020; I am overwhelmed by the reasons for the diminishment of outdoor play and I am not alone.

My family was low-income and I spent most of my childhood within a smaller suburban trailer park with my grandparents. From an early age, I learned to investigate the insects on the tiny parcel of yard. I traced the bark of the tree, studied the leaves, and even climbed the tree a few times when my grandparents were not looking. The television was only on for the noon news and in the evening. During the day, I had to turn to other sources for entertainment. We had no computer or video games. As I grew older, I rode my bike all over the small city as that was my only option of pre-teen/ teen freedom. I remember walking down an abandoned railroad line to investigate the animals and plants. I claimed a small space and built a fort and even tried to grow my own food. The things I did in natural spaces as a kid have helped me in my adulthood. Those times allow me to see patterns and changes in natural areas, give me a strong sense of independence as an adult, and have given me a keen sense of observation.

Richard Louv coined the term Nature-deficit disorder in 2005 to describe the increasing disconnect between youth and the natural environment. Since 2005, many people have written

about the topic with one of the more recent being Scott D. Sampson in his book, *How To Raise A Wild Child: The Art and Science of Falling in Love with Nature*. During the past fifteen years, many national groups have developed to help address this disconnect, like Children and Nature Network, Free Forest School, The National Forest Foundation, and the Outdoor Alliance for Kids. Several East Central Indiana nature groups like Red Tail Nature Conservancy, Robert Cooper Audubon Society, Cope Environmental Education Center, Master Gardeners groups, and even art museums that display local natural heritage pieces are working hard at connecting youth to local natural places. I applaud the efforts of these groups to get families and youth out into nature as every small gain helps.

The task of re-connecting youth to nature is not an easy one as there are many complex reasons behind nature-deficit disorder. Economic hardships due to higher cost of living, less un-structured free time, media portrayal of stranger danger and other safety concerns, and a myriad of educational issues have all factored into the decline of youth spending time in nature.

Executive Summary

This creative project begins by highlighting the reasons behind nature-deficit disorder. Further research into nature-deficit disorder lays a framework that will allow us to understand the complexity of the problem and approach solutions in a more holistic way. Interviews, observations, and work in the field of endeavor were used to give further credence to research findings. Through exhaustive research, I chose to use educational curriculum to mitigate some of the effects of nature-deficit disorder. In the creation of my curriculum, I focus on one area of

Indiana that lacks place- based nature education curriculum. Upon constructive review of my project, I have made recommendations for further research.

Literature Review:

Electronic Gadgetry and Youth Disconnect with the Natural Environment

Technology has existed for many generations but it was not until the end of the 1980's that the influence of computers and gaming systems for personal use became mainstream. Since 1988, the efficiency, functionality, cost, and availability of electronic gadgets has changed drastically creating more accessibility and allure. "Today, the average child between the ages of eight and seventeen spends on average seven hours and thirty-eight minutes per day plugged into electronic devices." (Foehr & Roberts, 2004, p. 2). Children are staying 'plugged in' to multiple devices at a time, seldom taking a moment to use imaginations or explore the surrounding landscape. A quote from Last Child in the Woods page ten, "I like to play indoors better, because that is where all of the electronic outlets are.," (Louv, 2008, p. 10). is one of many references that highlight the allure youth have to electronics; this allure also causes children to want entertainment instantly.

Instantaneous gratification is wanting an outcome to occur without pause or delay. While instantaneous gratification is necessary for some things like eating to not feel hungry, the trouble arises when as a culture; we expect every facet of life to be instant. Electronic entertainment media of today feeds into this need to want something right now. Instead of using ones' imagination to turn a tree into a protective fortress, kids turn on a video game and are immediately taken into another world. With a click of a few buttons, a child can learn almost everything there is to know about a sugar maple tree; everything except what it feels like to have

a sensory experience with the tree. “Dramatist Max Fisch defined technology as “the knack of so arranging the world that we do not experience it.”” (Burniske & Monke, 2001, p. 24).

A similar problem arises when electronic entrainment media uses the ‘wow factor’ to lure children into further engagement. As defined by the online Cambridge dictionary, “the wow factor is a quality or feature of something that makes people feel great excitement or admiration.” (Cambridge Dictionary, 2020). Many youth of today have had enhanced electronic gadgetry as a part of their lives; they have become accustomed to expecting the most up-to-date graphics and features. Natural environments have to compete for children’s attention amidst the allure of enhanced graphics, the need for instant gratification, and the accessibility of electronic devices. However, electronics alone are not the sole cause of nature-deficit disorder but part of a complex problem.

Economic factors Inhibiting Connection to the Natural Environment

Many families face hardships that can alter the amount of time spent in nature, hardships like sickness and income disparity. Lower income families however have a harder time connecting with some natural areas when lack of income is the source of the problem. In Indiana, minimum wage is $7.25 per hour. One adult with one child working forty hours a week at the Indiana minimum wage makes twenty-five cents above the poverty level according to the living wage calculator created by MIT. (MIT: Living Wage Calculator, Glasmeier, 2004). Once additional family members are factored into the equation, the gap between minimum wage and the poverty level increases. Similar financial situations exist in other states according to the MIT living wage calculator. Under financial constraints, it would be harder for low-income families to

expend gas money or pay admission fees to visit natural areas located in state parks or similar. Lack of un-scheduled time is also another factor that merits discussion.

Factor in the information from the preceding paragraph with the rise in low-income families; lack of un-scheduled time becomes an issues "Single-parent families have almost tripled since the 1960's; the percentage of children living in these situations in 2014 was 26%." (Pew Research Center, Dec. 17, 2015). As the single parent works forty hours a week just to provide for basic needs, that parent must also ensure that household chores, errands, and homework are being accomplished leaving little time that is unaccounted for. In some areas, even if there is free time, the infrastructure of the city does not allow for safe navigation to natural spaces. (Greening the Ghetto by Majora Carter, delivered in a Ted Talk, (2009)). Another factor in the disconnect youth have with nature requires looking into how the western culture has shifted since the 1980's.

The Over-scheduled Child

'It appears every moment of a kids' day is packed full of activities. Kids go from school to after-school activities and on the days when kids do not have sports activities there are often other activities involved like scouting or religious functions.' (Orr, 2004). Children no longer have free time to explore their surroundings or to reflect on a special place. "Adults intent on teaching techniques of dancing, sports, music, art, drama etc. squeeze free play at one end while video games and television…. squeeze it from the other." (Orion Magazine: Unplugged Schools, Monke, Sep./ Oct. 2007).

Homework is also a requirement of kid's time. Those children that are rushed from one activity to another often do their homework in the back seat, held evident by looking into the backseats of many vehicles during kid's sports practices. The homework that remains unfinished at the end of after-school activities is left to be finished once the child gets home and has eaten, leaving almost no downtime. Slightly more free time is available on the weekends as the students are not in school but that does not mean that it is being spent in natural spaces, partly due to safety concerns. "Many parents prohibit their children from exploring natural areas due to parents concerns about safety and academic pressures and other demands on their time." (Louv, 2005)

Safety Concerns Among Parents

"A recent study of 830 mothers found that although seventy percent of today's mothers played outside daily when they were kids, only thirty percent of them allow their children to do so today." (Mainella et.al, 1994, p.91). Several themes have developed that help describe reservations parents have about letting their children play outside: themes like stranger danger and concerns about neighborhood safety.

Stranger danger is a term used to describe 'a potential danger' children have with adults of whom the child is not familiar. "Stranger danger has been around since 1949 with the inception of "The Dangerous Stranger" film" (Davis, S. 1950). since that time, the influence of media has heightened awareness and at times allowed exaggerated accounts to occur. According to the Federal Bureau of Investigation, the years 2010- 2014 saw a decrease in the numbers of missing persons, comparable to years prior to 1990 and of those missing persons, only 39.7 percent are under the age of eighteen, today, that number is less. Data indicates that the problem

has decreased significantly however, increased media exposure plays into the fear and the result is children not being allowed to spend time outside even while having an adult with them.

During a teaching experience at an Indiana middle school, I overheard a surprisingly high number of young teens commenting that their parents will not even let them walk to a friend's house, even with the friends' older sibling with them. One student commented, "My parent thinks they have to take me everywhere. I can't stand it; they hover so much." (Personal Communication, April 2015). While stranger danger should not be as much of a factor in kids disconnect to the outdoors and natural areas; especially as the child reaches the teen years, the rise in urbanized living, however, creates safety concerns that need to be addressed.

In a report released on March 4, 2015 by the United Census Bureau, in the year 2013, 71.2 percent of the mid-west lived in urban areas. With increasing concentrations of people living in urban areas, there are more opportunities for neighborhood violence in the forms of property destruction and violent crimes like assault, and domestic disturbances. The United States Criminal Justice Center released a report in 2016 reporting:

> A 3.9 percent increase in the estimated number of violent crimes and a 2.6 percent decrease in the estimated number of property crimes last year when compared to 2014 data. According to the report, there were an estimated 1,197,704 violent crimes committed around the nation. While that was an increase from 2014 figures, the 2015 violent crime total was 0.7 percent lower than the 2011 level and 16.5 percent below the 2006 level.

While recent numbers could validate parental concerns for sending their children outside to explore some natural areas, overall, data indicates that a shift needs to take place; a parental shift

that will allow kids to develop more independence within the outdoor world. That shift is indeed taking hold with the "Free Range Kid" movement.

In a 2018 NPR interview with parent Laura Randall, she talks about the backlash she has received from other parents when she allows her child to play in the woods alone. The interview goes on to talk about "Let Grow clubs" that are gaining momentum in some areas and that one school in particular started a "Let Grow" program to encourage kids to do things on their own and the results were "more self-assured and confident children." (Nakamura, NPR, 2018). While some of those activities were smaller scaled like walking a few aisles away from parents in the store, imagine how positive the impact would be if those experiences were extended into natural spaces. There are many health benefits to kids when they explore outdoor environments.

Positive Health Benefits of the Natural Environment

Recall back to the section on the over-scheduled child and how every moment of many kid's days is packed full of activities. A result of the over-scheduled child is stress. "Almost a third of children reported [in 2010] that in the last month they had experienced a physical health symptom often associated with stress, such as headaches, stomach aches or trouble falling or staying asleep." (Clay, 2011). One of the most crucial aspects in life to reduce stress is having restorative settings. Restorative settings are places that allow for an escape from daily life in order to provide for inner balance. "Restorative settings promote a sense of being away, that is, a change in the location and activities of daily life. Restoration associated with natural settings is greater than restoration received from non-natural settings." (Gorst et. al., 2011, p.76). Children need to be able to connect to natural areas and disconnect to the many pressures they face. "A

reason to develop ecological place meaning among students is to allow them to understand the environmental place they live and learn to appreciate it." (Russ et. al., 2015).

Educational Factors

The Age of Standardized Testing Inhibiting Environmental Education

The 'No Child Left Behind (NCLB) reform' of 2001 brought about a rise in yearly testing for students. While listening to teachers talk about what it is like to teach in public schools since the 2001 reform, it is apparent that 'teach to the test' has become the predominant delivery method, whether by will or necessity is the question. It is important to indicate that initially NCLB gave promises about raising accountability and providing adequate resources to lower income students in struggling schools according to the American Education Association.

As standardized testing becomes more high-stacked and mandates for more standardized tests in math and language arts has caused many subjects to be cut or severely reduced, environmental education and science in general being among those subjects cut. "In a 2011 national survey, two-thirds of teachers said many academic subjects had been crowded out by an increased focus on math and language arts." (National Education Association).

Impacts to Teaching Environmental Education

An Illinois study was conducted in December 2006 to assess environmental education in elementary schools. Two-hundred Illinois public elementary schools were chosen to include a balanced mixture of rural, sub-urban, and urban schools. Most of the respondents indicated that they taught environmental education topics only two- five times per year for eleven- twenty

minutes per lesson. Lack of class time was the number one reason given for not teaching environmental topics. (Young & Lafollette, 2009).

In a Nebraska study, three elementary schools were randomly selected. Surveys were sent out to fourth, fifth, and sixth grade teachers, fifty-seven urban and eighty-one rural. A result of that survey indicated that almost half of those teachers had no training in environmental education. Of the teachers that used environmental education curriculum, ninety-four percent used ready-made materials. (Lane & Fritz, 2000). When teachers are less competent about a topic or area of study, it can be easy to gloss over details never really engaging with the content.

Arising out of lack of time and competency is the reliance on ready-made materials that might not be the best ways to teach environmental education because often there is no interaction between the natural environment and people. "The problem is that a great deal of the environmental education being done in our schools is not helping children connect to the place where they live." (Kriesberg, 2010, p. 17). Nature-deficit disorder is amplified when children are not learning about the environment that surrounds them. To sum it up, students are learning environmental education just a few times a year with lessons that are often about the far away instead of the nearby all within the confines of a classroom that fails to allow any interaction with the environment. Teaching environmental education is further impacted by the lack of recurrent field trips. Through our discussion about nature-deficit disorder, I have given an overview of the economic, socio-cultural, and educational impacts that factor into the disconnect youth have with nature. I will now shift my attention to highlighting important practices in creating effective place-based nature education curriculum that will help foster connections with the natural environment.

An Interdisciplinary Place-Based Approach

Given the lack of time teachers have to incorporate environmental education, finding ways to teach the content within multiple subjects is ideal and just makes for better learning. “By integrating environmental education into the entire curriculum, you can find time to teach it and bridge knowledge gaps.” (Kriesberg, 2010, p. 18). Since the 1990’s, schools across the United States, have been using the local environment as a foundation for teaching and the number is increasing.

Sunnyside Environmental School is a public urban school in Portland, OR that uses the urban environment as a teaching tool. The school moves beyond the building out into the natural world and local community where students learn about environmental responsibility, service learning, and diverse cultural experiences. The school has found a way to integrate all subjects through local experiences that allow the students to foster inquiry and exploration while unleashing students from the confines of a building; students are able to “feel” their place. (Martusewicz et.al, 2011).

Discovery Charter School in Porter, IN is a place-based school. At Discovery Charter School, place-based education is at the core of the teaching rationale. Relevant context within the localized environment increases the connection within our local community. Teachers support students to learn and interact with the local environment and regional places like Indiana Dunes and Lake Michigan. (www.discoverycharter.org). The Orchard School in Indianapolis is a private independent school that sits on forty-three acres of forested area. Students from an early age interact with the forest and develop an inquisitive mind. Formulating critical questions that engage in independent and teamwork through investigation and inquiry.

While those schools hold but a few students in comparison, integrated learning about the environment can still be accomplished in all public elementary schools and the results are academically positive. Participating in environmental education programs [learning] incorporate reading, writing, and oral communication skills to name a few. The approach needs to be place-based as well. "A curriculum based on building a relationship between the structure of the local landscape and the shape of the children's lives must replace our nonsensical focus on the far away. We need a curriculum that aspires to ecological literacy- a deep understanding of the flora, fauna, water, culture, and communities that children live in." (Sobel, 1998, p. 32). Sadly, when students do learn about environmental impacts or topics, there is talk about the rainforest or locations that are far removed from the context of the child. Children are capable of great things when the learning framework is connected and relevant.

Targeting Grades Third through Fifth

"The National Environmental Education and Training Foundation 1994 report found that younger children, grades 4-5, had the highest level of concern about the environment, confirming the importance of beginning quality environmental education during the elementary years." (Lane & Frist, 2000). David Sobel, in his work with children and map making, found patterns of development indicating that children from the ages of eight to eleven are in the 'exploration stage'. During the exploration stage, children's curiosity has extended beyond their backyard to include learning about their neighborhood, school grounds, and the natural environment that surrounds them.

Edward O. Wilson coined the term "biophilia" or nature love to describe the innate desire we have for nature. 'Without exposure to natural areas, this innate desire will remain dormant,

alive but not actively growing.' (Wilson,). Sadly, age nine is when we begin to see this disconnect between nature and children. "Results [of a 2010 study] suggest that significant declines in eco-affinity emerged between the ages of nine and ten." (Larson et al., 2010). Eco-affinity is a term used to describe an un-taught care for the environment. Reasons given for the decline in eco-affinity at age nine directly relate to those discussed in the previous section, The Over-scheduled Child. It is crucial to keep those natural connections active and engaging for continued interaction as the student ages. However, doing so requires a shift in thinking, a shift that allows the child to see that they are a part of and not removed from the environment.

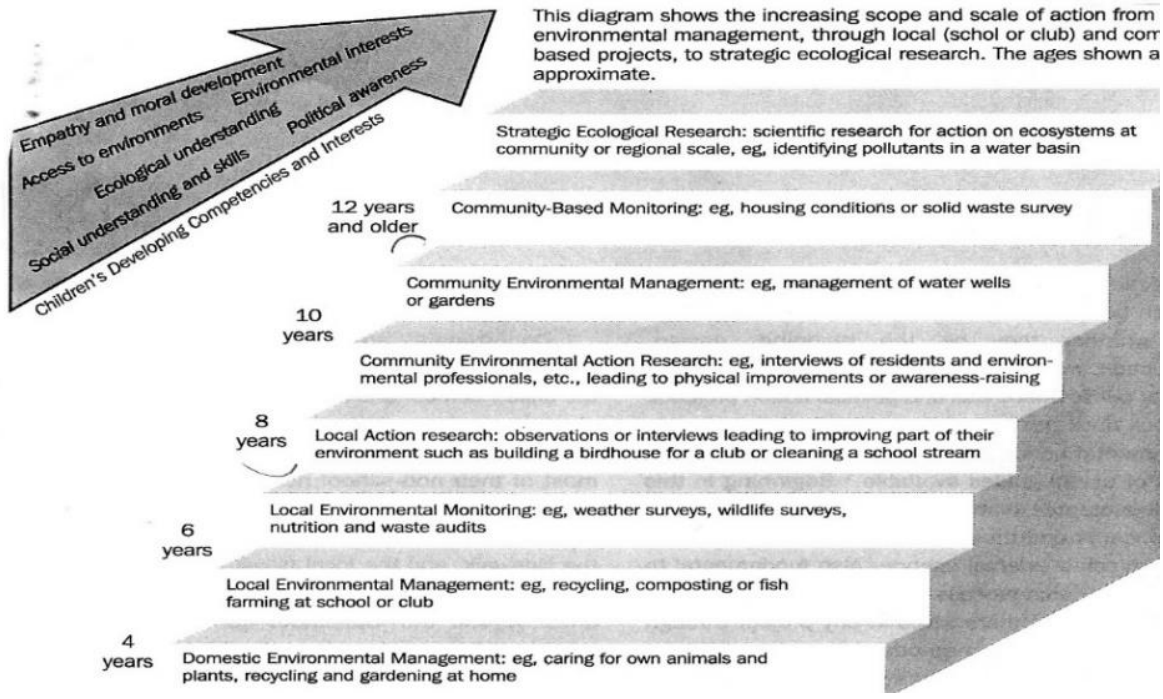


Figure One: Children's Developing Competencies and Interests

Figure one was developed by David Sobel, a well-known writer and place-based educator. Through his many years of research into how children learn and understand nature education, he developed a 'Competencies and Interests' chart. I use this chart to highlight the importance of focusing on grades three through five as those are crucial times for holding captive and keeping those connections with nature.

From Linear Thinking to Interrelated Thinking

"A principle of western philosophy since the age of enlightenment has been to create the illusion that humans are distinct from nature." (Measham, 2007). People and the land are connected and the reciprocity is circular not linear. It is important for students to learn how their actions affect not only the environment but also other people both positively and negatively. A trend has been occurring with science educational standards, a trend that continues to push on linear thinking; the relationship between the person and the environment is further removed with each new set of science standards. "Western education credits the provision of knowledge, facts, and figures with motivating people to care for [and connect to] the environment in more responsible ways. Research on changing learning behavior indicates, however, that a linear knowledge and motivation does not exist." (Blanchet- Cohen, 2008).

In 2001, a small study was conducted in Indiana to gauge the immediate and short-term impacts of environmental interpretation programs. The results of this study found that student's experiences were more successful when they were active, engaged participants versus being 'didactic' and passive. Students were able to recall and retain more information when they were active [in mind and body] and engaged. Passive experiences had the opposite effect;

"information was vaguely recalled at best and in many cases misunderstood and misinterpreted." (Knapp & Poff, 2001).

Methods:

Field Observations

During 2015- 2019, I had several opportunities to teach environmental education to children from urban, suburban, and rural areas, from all socio-economic backgrounds, and racial minorities. My experiences during these five years have taken me to many locations: Southern Indiana 2015, 2017; Wisconsin 2015; Central Indiana 2016; Pennsylvania 2018; and Michigan during 2019. Through these experiences, I have observed many behaviors that parallel the literature of the disconnect and lack of exposure youth have with nature.

One of my first experiences teaching environmental education to youth was in southern Indiana. The students would come out for a three-day, two-night experience. Many of the students, mostly from urban schools, would come out with the mind-set that they would not get dirty or have fun, let alone participate. So many complaints about missing video games or not being able to do something on a phone were common on that first day. It is amazing to see the transformation that takes place during the second day. For the first time in most of these kids' lives (according to their teachers), they are truly having multi-sensory experiences with nature and the look of a genuine smile and the awakening of that curiosity they once had as young children comes alive. The number of students feeling a sense of sadness in leaving the nature directly points to biophilia, the innate love of nature.

Time and time again, in every state I worked in, many of the students came in with one set of thoughts and left with a totally different set. Without school field trips, I am not certain if some of those children would have any experience with the natural world. Allowing students to have these experiences with nature, to become engaged, and see the natural world come alive is very important. However, these field trips and experiences are becoming harder to achieve based on the myriad of literature findings.

Allowing students to connect with their local environment is impacted greatly when field trips require extraneous effort to obtain. In an interview with an assistant director of a well-known Indiana environmental education destination, I asked about the hurdle's teachers face in planning field trips and the response was,

> "Teachers must make certain the field trip hits state educational standards and must list those standards on the field trip form and for certain school systems, even on the transportation form. Beyond indicating the standards being met, teachers must also prove that the field trip is necessary. Teachers must also raise and document a certain percentage of the field trip fees. [Due to budget cuts] teachers sometimes must provide 100% of the cost including the transportation fees. Teachers are then left to the mercy of school administrators to give the final approval."

While interacting with teachers in Pennsylvania, I learned that getting parent chaperones was difficult as the chaperones either did not want to limit phone usage or could not get time away from work. At times, getting kids motivated enough to even want to go into "the woods" would cause principals to re-think the necessity of the trip.

My more recent experiences in environmental education have even pointed to the beginning of a disconnect between some younger educators and the natural areas which they work in and are surrounded by. It is almost like they are working in the environment but not connecting to it as they haven't had as much opportunity due to many factors, perhaps those indicated in the literature review.

Field Interviews

I conducted two interviews over the phone and three in-person. The in-person interviews were recorded by a device, transcribed a day or two later, and then saved onto a flash drive. The two interviews over the phone were written down while the conversation occurred and later typed out and uploaded onto a flash drive. All interview documents were kept under a two-lock process in keeping with IRB rules. I purposely selected the initial five interviewees for their experiences within the education field.

The first interview I conducted was in-person with a fifth-grade teacher during teachers' night at Bradford Woods. The second interview was over the phone with a director of the Myyamia Center. The third interview was conducted over the phone with a Natural Sciences professor at Manchester University. The fourth interview was in-person at an East Central Indiana, hereby known as ECI, environmental education facility. The fifth interview was in person with an Assistant Director of an environmental education center. After thoroughly reviewing all five interviews, common themes emerged that paralleled the literature review with lack of time and/ or teacher understanding of environmental education being reported often.

In an interview with Ms. White, a thirty-year teacher in an Indiana public school, I asked her, "How has No Child Left Behind affected you in your teaching pursuits?" Her response was, "I feel like it is much harder to be a creative teacher. I feel stressed about the amount of content I need to cover and I can tell that the kids are stressed too. I used to enjoy teaching and there are still moments that keep that joy alive but those moments do not happen as often as they used to." (Personal Communication, March 2014). "Mr. Woods, former educational naturalist states, "the only way that environmental education is going to seem important [under current mandates] is if it increases test scores." (Personal communication, 2014).

East Central Indiana as a Focal Point

ECI, is comprised of Grant, Blackford, Jay, Madison, Delaware, Randolph, and Henry Counties.

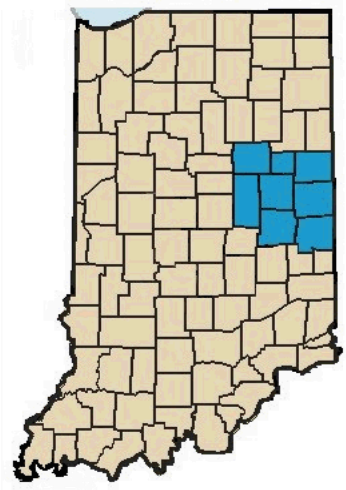


Figure Two : Indiana Map: East Central Counties highlighted

"Within East Central Indiana, 62,516 students in grades third through fifth attend public schools." (www.stats.indiana.edu) Teachers have a lot of contact with students, sometimes more time than parents have, therefore, teachers are key resources in aiding in this continued

connection to nature during the crucial ages of eight to eleven. In a 2014 article published by the Indiana Environmental Education Association a statement indicated that, "East Central Indiana has received a lack of attention over the years for its role in aiding in revitalization projects and the environmental education programs that exist."

After looking through several textbooks that have been or are currently used in ECI schools, I found that there were not many examples that can directly relate to this region in Indiana. I have taken some activities from two widely used textbooks, *Science: See Learning on a Whole New Light* Indiana edition and Macmillian/ McGraw- Hill *Indiana in the Nation and the World* and adapted them into place -based formats so children in ECI can learn about their surroundings.

Through investigation of Indiana history textbooks, I noticed that any time Native peoples were mentioned they were spoken of as a "people of the past" and with no present-day connections to Indiana. That investigation led me to observe two local school groups at Mounds State park and listen to the comments they made during interacting and learning about Native peoples. Many of the children had no idea about Native peoples having been in the area; many of them only thought of "Indians as being out west."

While working with youth in Minneapolis, I thought that perhaps students in those schools would be learning more about Native peoples given the amount of trust and tribal land in the area but still the amount of education being taught about Native peoples was minimal.

Results:

A culmination of an exhaustive literature review, field observations, formal interviews, and textbook investigation have led to the creation of place based, culturally relevant education curriculum.

Curriculum

In response to the barriers I have heard about and observed, I have developed four lesson plans and map use ideas with corresponding maps to be a resource for area educators.

Lesson Packet One:

Native American history is the emphasis of curriculum area one. I have included for teachers, information about the Myaamia Project, Indian Land Tenure Foundation, The National Museum of the American Indian, and the Indiana Department of Natural Resources all of which have created relevant lesson plans about Native peoples, not only in Indiana but in other locations as well. I have also included two lessons with corresponding printouts; this packet begins on page 40.

Lesson Packet Two:

Fostering stewardship is the emphasis of curriculum area two. I have created two lessons that gives teachers activities that will allow students to understand about human actions and how those actions can help revitalize and/ or minimize negative impact to the land. Each lesson has corresponding handouts; this packet begins on page 54.

Lesson Packet Three:

Establishing a sense of place is the emphasis of the third curriculum area. A series of seven contour maps were created, one map per county is ECI. Each map has a location that children from the county should be familiar with. While I have not created lesson plans for these maps, I have provided educators with ideas that will really help students connect and learn about an area near to them while hitting many subject areas. Teachers can find map use ideas and maps starting on page 47.

Discussion:

My observations of youth in nature have highlighted the need to allow for more exposure to natural spaces, the connections made are real and do have a positive impact. This finding directly aligns with what Richard Louv says in his book, *Last Child in the Woods,* that attachment to the land is good for the child.

Educators in my study have all pointed to how hard it is to give the attention natural science deserves in the classroom. This finding directly aligns with what Daniel Kriesberg says in his book, *A Sense of Place,* children feel they learn only a little or practically nothing about the environment in school.

Next steps for this study area should include: Mitigating nature-deficit disorder in cities that have significantly poor air quality that would cause harm for those spending time outdoors. Exploring, in-depth, into cities with an overwhelming amount of crime creating a legitimate concern for being outside. Understanding how different cultures within the United States relate to the environment and ways that programs and teachers can connect to those people groups. Creating databases that pull together environmental education programs both at the state level

and in regions within the states so that educators time constraints do not impeed teaching environmental education.

Recommendations to teachers in ECI about best practices in teaching environmental education:

- Teach about local natural areas.
- Use as many senses as possible.
- Creative assignments that will allow the child to connect to an area will foster engagment.
- Lessons can involve observation and reflection as those activities can be incorporated back into the classroom.

Summary

There are many factors involved in the disconnect between youth and the natural environment. As educators, we have a difficult task of overcoming these obstacles to ensure that children in ECI are able to connect to their immediate surroundings and foster a sense of place; not just from a purely environmental approach but through a cultural one as well. However, teachers alone cannot take on the quest of keeping nature connections alive; family units need to help foster these connections as well. Allowing kids to have a good balance of activities versus free time, engaging with your children in outdoor exploration as you once did as a kid, finding a group to help kids create meaningful nature connections, and limiting the amount of time with electronics. Daniel Kriesberg of New York said it best, “We show our students the door, give them a chance to get out and explore. Some will stay, and that’s what count.

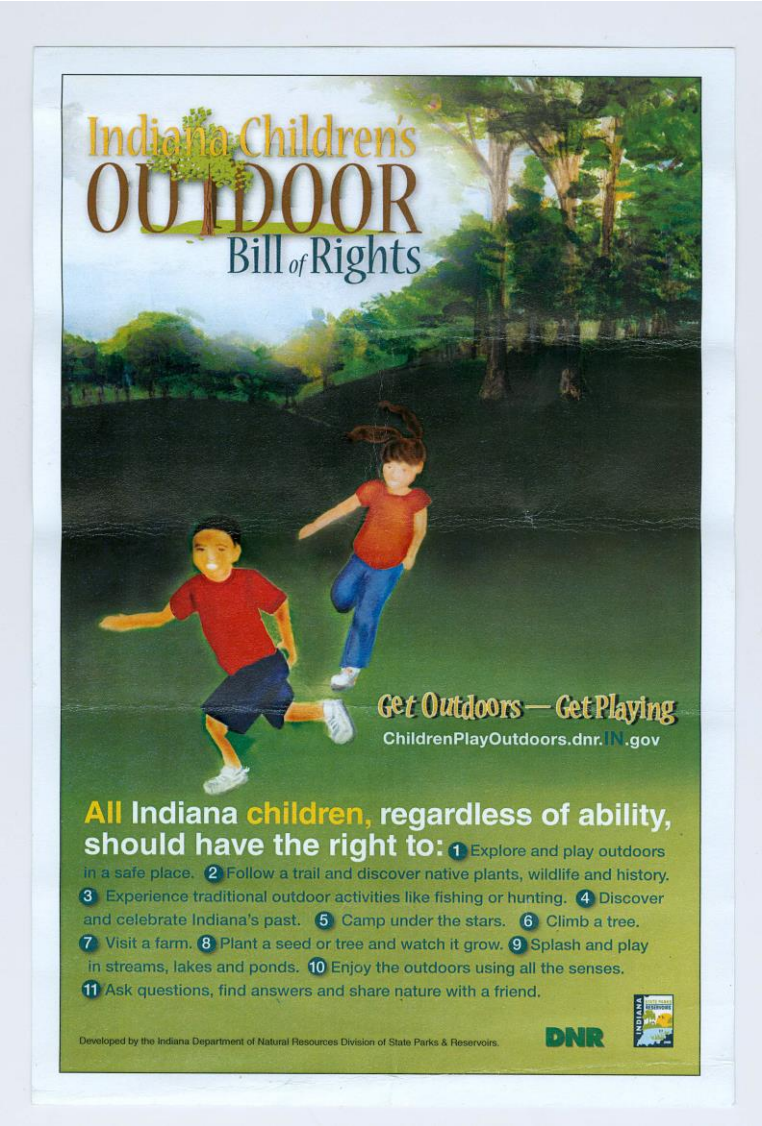


Figure Three: Indiana Children's Outdoor Bill of Rights

Figure three, the Outdoor Bill of Rights, was created by the Indiana Department of Natural Resources as a way to get more families outdoors and to help connect children to natural areas and to foster stewardship.

Works Cited:

Burniske, R.W. & Monke, L. (2001) Breaking Down the Digital Walls: Learning to teach in a post-modern world. New York Press.

Cambridge Dictionary. (2020). the wow factor. In Cambridge On-line dictionary.

Carter, M. (June, 2006). Greening the Ghetto. [Video] TED. Majora Carter: Greening the ghetto | TED Talk

Davis, S. (Director). (1950). Dangerous Stranger. [Film]. Sidney Davis Productions.

Glasmeier, Amy. (2015). MIT: The Living Wage Calculator. Living Wage Calculator (mit.edu)

Gorst. et al. (2011). Youth Development and the Camp Experience. New Directions for Youth Development.

Knapp, D. & Poff, R. (2001). A Qualitative Analysis of the Immediate and Short-term Impact of an Environmental Interpretive Program. Environmental Education Research, (7) (1), 55-65.

Kriesberg, A. A. (1999). A Sense of Place: Teaching Children About the Environment with Picture Books. Teacher Ideas Press.

Lane, K.R. & Fritz, S.M. (2000). Environmental Science in Rural and Urban Elementary Programs in Nebraska. Journal of natural resources and life science education, (29), 125-129.

Larsen, L. R. et. al. (2010). Effects of an Environmental Education Program on the Environmental Orientations of Children from Different Gender, Age, and Ethnic Groups. Journal of Park and Recreation Administration, (28) (3), 95-113.

Louv, R. (2008). Last Child in the Woods: SAVING OUR CHILDREN FROM NATURE-DEFICIT DISORDER. Algonquin Books.

Mainella. et. al. (2011). Outdoor-based play and reconnection to nature: A neglected pathway to positive youth development. New Directions for Youth Development.

Martusewicz, R. A. et. al. (2011). Eco Justice Education Towards Diverse, Democratic, and Sustainable Communities. Taylor & Francis Group.

Monke, L. (September/ October 2007). Unplugged School. Orion Magazine. Orion Magazine | September/October 2007.

Nakamura, B. (Host). (September 3, 2018). To Raise Confident, Independent Kids, Some Parents are Trying 'Let Grow'. [Audio Podcast Episode]. National Public Radio. Prichep, D. Raising Free-Range Kids In An Age Of Helicopter Parenting Is Tough : Shots - Health News : NPR.

Orr, D. W. (2004). EARTH in MIND: On Education, Environment, and the Human Prospect. ISLAND PRESS.

Pew Research Center. (December 17, 2015). Rise in Single Parent Families. Pew Research Center | Pew Research Center

Roberts, F. D. & Foehr, U.G. (2004). KIDS AND MEDIA IN AMERICA. Cambridge University Press.

Russ, A. et. al. (2015). Development of Ecological Place Meaning in New York City. The Journal of Environmental Education, (46) (2), 73-93. DOI: 10.1080/00958964.2014.999743

United Census Bureau. (2015). Data Profiles.

United States Criminal Justice Center. (2016). Bureau of Justice Statistics.

Young, R. M. & LaFollette, S. (2009). Assessing the Status of Environmental Education in Illinois Elementary Schools. Environmental Health Insights, (3), 95-103.

Appendixes

Appendix A: Annotated Bibliography of Suggested Children's Books

Non-fiction

Flanagan, Alice K. *Simple Science : Soil Compass.* Minneapolis, MN: Point Book, 2001

ISBN- 0-7565-0035-4

This book contains basic knowledge about soil and would probably work best for students in grade three and beginning of the year fourth graders. Most of the information is pertinent to East Central Indiana (ECI). Information included is soil components facts, information about biome soils, and things kids can do to help care for the land.

Johnson, Rebecca L. Illustrated by Saroff. Phyllis V. *A Walk in the Deciduous Forest.* Minneapolis: Carolhoda Books, Inc., 2001 ISBN: 1-57505-155-9

This book is an awesome one to use after a nature walk and works well for students in grades three through five. The illustrations are great in that they represent the types of animals and the animal habitats that kids within the ECI region come into contact. The book has it all with site relevant information and illustrations coupled with concrete knowledge to promote place-based nature learning.

Silver, Donald M. Illustrated by Wynne, Patricia J. *One Small Square Backyard.* New York: W.H. Freeman & Company, 1993 ISBN: 0-7167-6510-1

One Small Square Backyard takes a closer look into the plant and animal species that can be found in their own backyards or school grounds and is relevant for students in grades three through five. The great thing about this book is the corresponding activities broken down by page content. Illustrations help aid in the learning process. This is a good book for assisting in establishing a sense of place as it challenges students to get up close and involved with the natural biota that is right in front of them.

Howell, Catherine Herbert. *My First pocket guide: Backyard Wilderness.* Washington, D.C.: National Geographic Society, 1999 ISBN: 0-7922-6927-6

All of the animals mentioned in this book exist in this region of Indiana. This guide is a good quick reference book that gives general characteristics, behavior, and locations for animals that students come into contact with. Backyard Wilderness is a good supplement to One Small Square Backyard or as a stand-alone book for a nature hike.

Appendix B: Annotated bibliography of suggested Children's books

Fiction

Mason, Jane B. Illustrated by Sorenson, Henri. River Day. New York: Macmillan Publishing Company, 1999 ISBN: 0-02-762869-8

River Day is a fiction book that is good for its illustrations and imagery given as a young girl and her grandfather take a canoe ride down a river. This book is good for a teacher reading to the whole class, having a discussion, and writing a reflection piece.

Bash, Barabara. *Urban Roots*: *Where Birds Nest in the City.* San Francisco: Sierra Club Books, 1990 ISBN: 0-316-08306-2

The bird species listed in this book have learned how to adapt to living in an urban environment. There are great images of where these birds build nests. I feel that this book could be used to discuss local habitat loss and those adaptations that birds have made.

I caution to not be overly negative about habitat loss, as too much gloom and doom will leave students feeling defeated.

Williams, Vera B. *Three Days on a River in a Red Canoe.* New York: Greenwillow Books, 1981

ISBN 0-688- 80307-5

This book is full of great imagery and the author takes on a child's voice for the narrating of the story. Within this book, students will learn how to tie a secure knot, set-up an A-frame tent, as well as learning about certain fish and waterfowl species. There are also some camp cooking recipes and pictures of camping gear.

Locker, Thomas. *Where the River Begins*. New York: Dial Books 1984 ISBN 0-8037-0090-3

A possible use of this book is to teach about where the White River begins and following its path out to the ocean. There are good images here but some are not relevant to East Central Indiana as there are no mountains here. This book could also be used as a tool for continued learning about dialogue as the conversation moved between a grandfather and his grandson.

Holling, Clancy Holling. *Paddle-to-the- Sea.* Boston: Houghton Mifflin Company, 1941

ISBN 0-395-15082-5

This interesting book blends imagination with factual experiences. A young Indian boy carves a canoe and inscribes Paddle to the Sea on the bottom in hopes that the twelve-inch canoe will indeed make it to the sea. The story follows the route of the canoe, the experiences and trials along the way, and the people that assisted in the quest. There is a map of the journey through the Great Lakes and the encounters teach about real experiences that exist on river routes. The amazing details in the illustrations add to the story.

Appendix C: Relevant Children's Literature Books

Indiana Reading Level System

Grade Three: Level N

Roy, Ron. *A to Z Mysteries: The Falcon's Feathers.* New York: A Stepping Stone Book, 1998 ISBN 0-679-99055-0

Grade Four: Level S

Paulsen, Gary. *The Hatchet.* New York: Scholastic Inc., 1987 ISBN 0-0440-47900-2

Paulsen, Gary. *Brian's Hunt.* New York: Scholastic Inc., 2003 ISBN 0-439-67686-X

Paulsen, Gary. *Brian's Winter.* New York: Scholastic Inc., 1996 ISBN 0-590-69013-2

Grade Five: Level T

Spear, Elizabeth George. *The Sign of the Beaver.* New York: A Yearling Book, 1983

ISBN 0-440-47900-2

George, Jean Craighead. *My Side of the Mountain*. New York: Dutton, 1959.

ISBN 0-439-20340-6

Grade Five: Level U

Erdrich, Louise. *The Birch Bark House*. New York: Scholastic Inc., 2000 ISBN 0- 439-20340-6

Clemens, Andrew. *A Week In the Woods.* New York: Aladdin Paperbacks, 2002

ISBN 0-689-85802-7

Appendix D: Bird Observation Sheet

Bird Observation *from* Take A Backyard Bird Walk

Bird Observation Notes *from* Take A Backyard Bird Walk

Bird Notes

	Bird #1	Bird #2
Location of bird		
Overall colors		
Wing bars (yes or no)		
Color of wing bars		
Color on head		
Color on chest		
Color on Back		
Other physical characteristics		
Approximate size and shape		
Behavior notes		
Identification?		

Use this area to draw or paste a photo of the bird

For You

There are lots of books about birds for kids. Here's one you might enjoy:

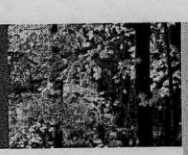
Backyard Bird Watching for Kids written by George H. Harrison, published by Willow Creek Press. This book covers the better known backyard birds. It recommends plants for the birds, gives ideas on how to feed birds, and teaches you about birdhouses to build or buy.

Need more room to draw or write? Use blank paper or download free forms at www.takeawalk.com.

Appendix E: Tree Observation Worksheet

Tree Observation *from* Take A Tree Walk

Tree Notes



Date:

Tree location:

Tree shape:

Circle one: Broadleaf or conifer

Bark color and texture:

Leaf Type:

Leaf color:

Flower or seed description:

Tree Name:

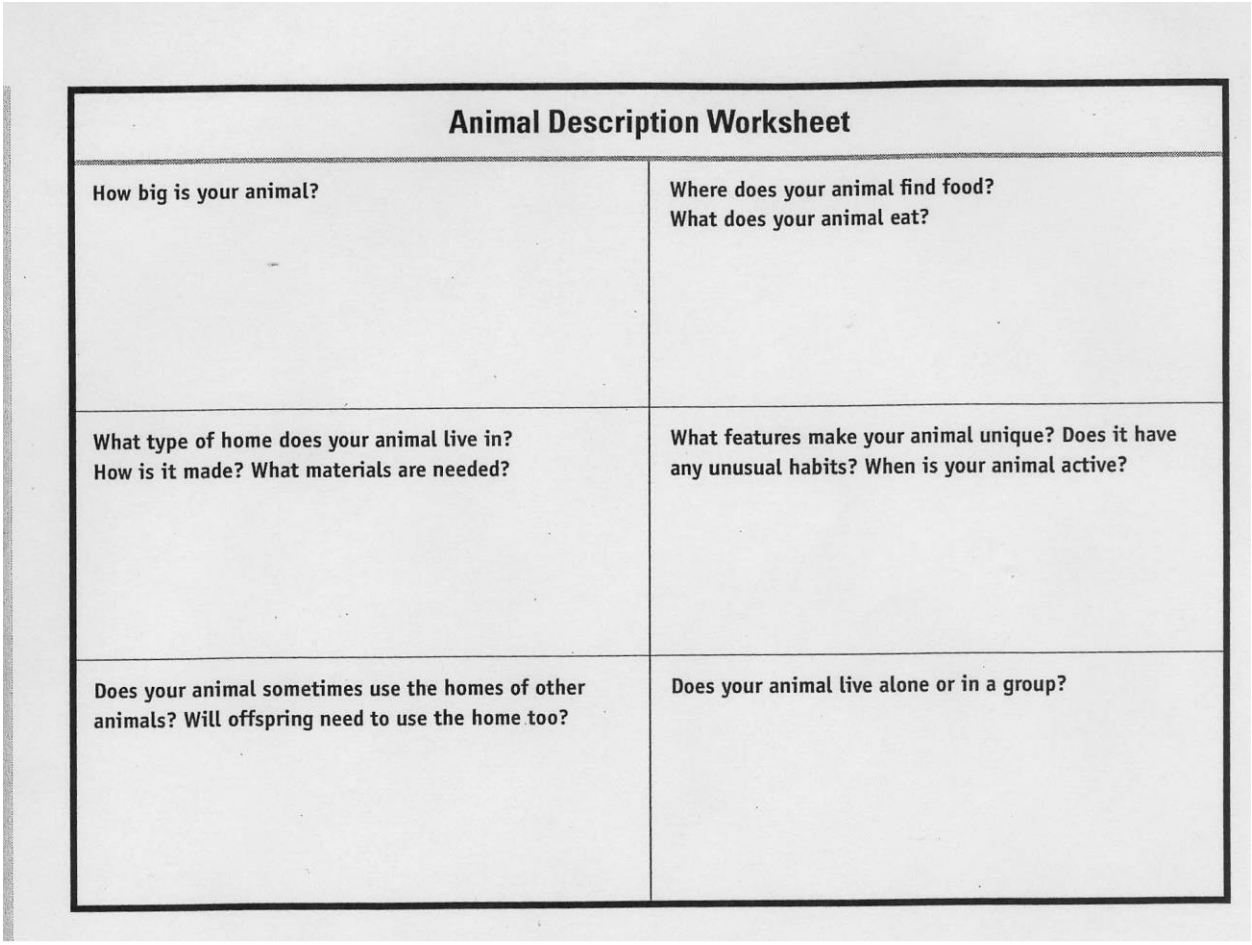
As Good as a Photo

Our friend Lauren Frail (age 11) wrote this about a tree she observed on her tree walk:

"The tree doesn't have many leaves but the leaves are a jungle green. The bark is grayish brown in color. The flowers are a clean white and they're soft like silk. In the centers of the flowers are green balls."

Lauren's description of the tree's flowers was so good, I knew which tree she was describing. Lauren found her tree in a field guide and identified it as a flowering dogwood. She was right!

Appendix F: Animal Description Worksheet



Animal Description Worksheet	
How big is your animal?	Where does your animal find food? What does your animal eat?
What type of home does your animal live in? How is it made? What materials are needed?	What features make your animal unique? Does it have any unusual habits? When is your animal active?
Does your animal sometimes use the homes of other animals? Will offspring need to use the home too?	Does your animal live alone or in a group?

Appendix G: Lesson Packet One

Miami Historically

Duration: 60 minutes
Subject: Social Studies
Setting: Inside or Outside
Vocabulary Terms: band, homelands, barkhouse, adze, stalking

Materials: wild edible handout

State Education Standards:
Social Studies: 3.1.1; 4.1.1, 4.1.2; 5.1.1, 5.3.11

Objectives:

1. Students will have a better understanding of the techniques used to make canoes.
2. Students will learn about wild edibles and how the Miami used them.
3. Students will use critical thinking skills to describe best practices for selecting living areas.

Summary: By participating in this class, students will be able to discuss the importance Miami had for living near water bodies, actively participate in creating an animal web of life, and learn about wild edibles and how they are/were used.

Background:

American Indian tribes, like many other ethnic groups, have explanations for how they originated as distinct, unique peoples. Origin stories create a respect for a place or location in which ancestors of the tribe were created. From these stories, tribes derived laws, values, traditions and ceremonies, forever connecting them to their *homelands*. Certain scientific theories (such as the Bering Strait Migration theory) and investigative sites often come into conflict with these oral history traditions. (1)

Prior to the arrival of Europeans, it is recorded that the Miami people lived in Ohio and Indiana. The Miami people are matrilineal which means that everything descends down from generation to generation through the female line. Children belonged to the mother's clan.

"Historically, the designation of a group as either a tribe or a band was often rather random, as the assigners were generally colonial administrators who had a poor understanding of indigenous political practices."(2) Many Native Americans defined *bands* as separate groups of people that were all related to the larger tribe through culture and language similarities.

Wigwams and Longhouses:

These were usually made of a framework of cut young trees with bases buried in the ground and with the tops bent over and tied together. The frames were covered with sheets of bark, usually

elm or chestnut.

Longhouses varied in length, width, and height. Depending on the length there would either be a central fire in the middle to keep everyone warm or two fires, one at each end.

- When Miami people selected locations for their longhouses, what were some things they likely took into consideration?
    - Proximity to water, availability of food, not encroaching on another settlement, not a fully enclosed canopy

Hunting Techniques:

Historically, hunting and gathering food was a big part of daily life for Miami. There were no refrigerators so foods either needed to be consumed quickly or preserved. The methods for preserving game were either by smoking or cutting the meat into thin strips and allowing it to dry in the sun.

Historically, young boys at about age eight began learning hunting and trapping skills by tracking down small game like squirrels. It was important that young boys increased their hunting and stalking skills in order to prove themselves worthy to hunt with the men when the time came. *Stalking* is the act of sneaking up on wildlife by using different techniques so as to avoid alerting them to your presence.

For many years, Native Americans, Miami included, studied the stalking techniques of many animals. Through observation and practice, skills were refined until the best methods were decided upon. Generally, Miami would have sent braves in a group to stalk out a deer herd. Once a herd or animal was spotted, the group would branch off and slowly approach from four sides (a technique learned by observing wolves.) Staying low and quiet increased the chances of making a kill.

Game Hunted:

- Ask children what game animals they think the Miami hunted/ ate.
    - Deer, raccoon, beaver, rabbit, turkeys, ducks, and geese

    - Important to mention that Native people used all parts of the animal. Ask children what other parts of the animals were used…for what? Bones were used as tools, hair pins, and sewing needles. Pelts were used for clothing, shoes, and blankets. Intestines were also used as sewing thread.

Canoes:

Birch bark canoes were not used in the Miami homelands because the type of birch growing there was not suitable for canoe making. Butternut and Tulip trees were often selected as they grow straight and are easily shaped. “Once a tree was selected, the bottom was set on fire while the trunk was wrapped with wet deerskin to keep the fire from spreading upwards. Periodically, the fire was extinguished and the charred portions were adzed away. The process of setting the

fire and removing charred areas until the base of the tree burned through took a while but eventually, the tree would fall on its own.

"In making a dugout canoe, a suitable tree trunk is selected and one side is adzed flat. Small fires are set to burn into the trunk, thus helping to hollow it. Charred parts are adzed or gouged out and the hull is finally planed smooth."

Historically, bones and stone tools were used to remove charred parts of the tree to allow for slow shaping. A crew of several men and boys would work on the canoe until it was completed. Completing the canoe was a slow process. There were no axes and chain saws like there are today.

Wild Edibles:

Plants and plant materials are important to Native people. Wild edibles were sources of food, provided materials for making baskets, and were used as medicines. Most plants the Miami used/ use were wild but some were domesticated plants like corn. (Use wild edible hand-out)

Concepts:

Homeland: A homeland is defined by native people as those areas that they still have cultural ties to. Places they lived prior to European contact.

Band: Many Native Americans defined bands as separate groups of people that were all related to the larger tribe through culture and language similarities.

Stalking: Stalking is the act of sneaking up on wildlife by using different techniques so as to avoid alerting them to your presence.

Works Cited:

1. https://www.britannica.com/topic/Difference-Between-a-Tribe-and-a-Band-1673365

2. https://www.lessonsofourland.org/wp-content/uploads/2017/09/15_Distinct_Worldviews_-_2014-08-08.pdf

3. picture of a primitive native american adze - Google Search

Primitive Adze

Shagbark Hickory: As the name implies, these trees have bark that peels vertically to give a shaggy appearance as they mature. The nuts of the Shagbark have a very sweet taste and serves similar culinary purposes as pecans. The trees produce nuts every year but the amount varies.

Cattails: Young shoots and stalks are eaten like asparagus. Later, these flower spikes produce pollen that can be gathered and mixed with flour. Starchy roots can be eaten like potatoes. Mature leaves are woven to make mats, baskets, and covers of the wigwam. Fluff is used for pillows and stuffed into mattresses.

White Pine: The most common coniferous tree in the Northeast – easy to ID from the bundles of 5 needles. Largely inedible except for the inner bark (flour) and the needles (tea). Boil needles in hot water for several minutes to produce a bitter, tea. The tea is high in vitamins A & C.

Wild Onion: The underground bulbs are excellent boiled, pickled, added to salads, or used as a seasoning. The green leaves can be cooked as greens or eaten raw. This plant is widespread and grows well in moist, well-drained soil.

Raspberry: 3-leaved vine plant common to the Northeast. Stems are pale green when young, turning maroon as they mature. Stems are covered with a white residue which can be rubbed off. Leaves are useable in teas. Berries make a great late summer snack, perfect right off the vine. Miami would use the berry juices as a dye.

Blackberry: 3-leaved vine plant similar to raspberry. Stems are very distinct, green with large rose-like thorns. Leaves and berries can be used just like those of raspberry. The Lenape would take the roots and boil them to help with diarrhea.

Jewelweed: Also known as Touch-me-Nots, is typically found near standing water. Flowers have a cornucopia shape with irregular petals. Mature flowers can be "popped" to get at the seeds which have a nutty flavor. Juices from the stems can be used as a remedy for poison ivy and to calm stinging nettle.

Wild Bergamot: A member of the mint family. Has showy purple flowers during the summer with characteristic square stems. Leaves and flower heads can be used for tea to calm upset stomach and insomnia.

Animal Expedition

Duration: 1.5hrs
Subject: Social Studies/ Cultures
Setting: Inside for the beginning but mostly outdoors
Grade Level: Third and Forth
Concepts: tracking, stalking, lean-to

State Education Standards:
Social Studies: 3.1.1; 4.1.1

Objectives:

1. Students will be able to identify, interpret, and follow animal tracks.
2. Students will learn how Miami stalked wild animals by learning how to control noise and appearance with proper balance, control, patience, and awareness.
3. Students will use critical thinking skills to build a lean-to structure.

Summary: By participating in this class, students will learn how to recognize basic animal tracks, learn the art of stalking and understand how a predator gets its prey. Students will also learn how to build a lean-to structure.

Background:

Tracking and Stalking are among the most ancient of all activities. True art forms, they have been practiced and mastered by members of indigenous cultures for thousands of years for hunting and survival. In addition to identifying what species of animal made a set of tracks and where they were headed, expert trackers can tell a whole host of information from just a few tracks or perhaps even a single track.

For many years, Native Americans studied the stalking techniques of my animals. Through observation and practice, skills were refined until the best methods were decided upon. Generally, Lenape would have sent braves in a group to stalk out a deer herd or bear. Once a herd or animal was spotted, the group would branch off and slowly approach from four sides (a technique learned by observing wolves), often using a stalking push-up technique. Staying low and quiet increased the chances of making a kill.

Introduction to Stalking:

Stalking is the act of sneaking up on wildlife by using different techniques so as to avoid alerting them to your presence. Stalking has three main parts: Agility, Balance, and Breathing. Agility is a very large part of stalking because you need to be limber. Balance is needed because you may be required to stop in mid-motion so that an animal doesn't sense you. Proper breathing is important to keeping your balance while stalking. In order to breathe properly you need to take long deep breaths in through your nose and mouth.

There were three main types of stalking techniques used by the Lenape: Walking, Crouching, and Stalking Push-Up. Walking is self-explanatory but a crucial element is being quiet. Crouching is the same as walking except for the fact that you walk with your knees bent and you have a lower center of gravity. Crouching stalk is used when you need to get under some branches or when you are approaching the top of a hill and you need to stay low so that you won't alert anything on the other side to your presence.

The Stalking Push-up is probably the most difficult to perform due to the fact that it takes a lot of energy and physical strength to do it. Although this stalk is taxing on your physical energy it is probably the most effective one to learn. All you need to do is lie on the ground in push-up position, do a push-up, and then gently move your body forward being careful not to touch the ground while moving forward. This stalk is best used when you are approaching the top of a hill or when you are in an area with virtually no cover.

Activity One: Sit the kids in a circle and have them act out the different stalking techniques.

What can tracks tell me?

Now is the time to transition the students into talking about tracks. Start out by asking students what animals' Native people would have historically seen in Indiana. Each one of these animals had a unique set of footprints called tracks.

Tracks can tell a lot about an animal for example, size, age of the animal, and if the animal is wounded or not. Tracking is not simply a search for footprints on the ground. The search for signs of animals includes all the evidence they might leave behind them, such as food scraps, scat, feathers or fur, dens, nests, or scents. You must put yourself in the animal's place. Where is the animal most likely headed? When you lose a trail, follow the line of tracks and look ahead to the most likely spot. Be sure to walk beside the tracks and not on them so you don't destroy the trail. Lastly, don't become so absorbed in the tracks on the ground that you are oblivious to the world around you.

Activity Two: Alright class, now we are going to pretend we are going on a tracking and signs hike and go over the 7 items below before-hand, either outside or in the classroom.

Tracking and Signs Hike:

1. Sounds
2. Eating Marks
3. Scat and Urine
4. Territory Marks
5. Homes/ shelters
6. Tracks and Trails
7. Body Parts and Fur

***In a wooded area, after a good bit of tracking, stop and read the following scenario:**

"Four Miami men are out on a hunt; they have traveled many miles in search of a deer herd. Two days into the hunt, a terrible storm develops and the men have no immediate shelter as they are in the middle of the woods. The best way of riding out the storm is to build a lean-to.

A *lean-to* is a temporary shelter either supported or free standing.

Activity Three: Split the group into 4 smaller groups and have them build a lean-to structure.

At the end of the activity, tell the kids that the men have survived the storm and now must continue tracking the deer. (A small reminder of what they are looking for might be needed.)

Conclusion:
Many people still use the tracking and stalking techniques of native people. While the animals they hunted might not be as abundant, those animals are still a part of the natural area in and around Indiana. Lean-to structures are also used today.

Optional Game: <u>Sneaky Fox</u>:

Materials: One Blindfold and one random object
Procedure:

1. Explain to the students that this game requires 2 very important things. Remaining quiet and listening.
2. Ask for the best listener and choose that person to be the guard. That person stands in the middle and puts on a blindfold. At his feet is the random object*.
3. Everyone else is a *Sneaky Fox* and must move at least 30 feet away, (20 feet for younger children), from the guard and sit down.
4. The instructor then asks for the quietest person and instructs them to try to steal the random object. They must sneak up to the guard, steal the object, and return to their seat without the Guard hearing them. If the Guard hears anything they think might be a *Sneaky Fox*, they clap and point in that direction.
    a. Remind the students that they must remain quiet so the *Sneaky Fox* has a chance. Ask them to pay attention to what the *Sneaky Fox* does.
    b. The Fox may not move once the Guard claps.
    c. The instructor servers as a judge and will say whether the Guard got the *Sneaky Fox* or not. If so the instructor will choose a new *Sneaky Fox* to try to steal the Random Object.
5. The person who steals the object and gets back to their seat without the guard hearing them will become the new guard.
6. **Harder:** If the Guard is really good try having 2 or 3 people sneak up on them.
7. At the end discuss what techniques worked the best for the Guard and *Sneaky Fox*. What didn't work so well?

* This random object can be anything from a rock to a stick, to a coffee mug. It should be something that the students can lift with one hand.

DNR: Animals (in.gov) This link will give an overview of the historic range of the mammals in Indiana.

FNR-413-W.pdf (purdue.edu) Purdue has put together a nice document with pictures of Indiana mammals. Each mammal has a picture, range map, information, and tracks prints are often included.

Picture of a Lean-to

Additional Sources for Native American Lessons:

1. "Telling our Story: The Living History of the Myaamia provides teachers and home - schooling families with a curriculum for teaching Myaamia (Miami Tribe) history to grades 3-12. The curriculum includes primary sources, images, videos, and lesson plans, which are all linked to the relevant content standards for Ohio, Indiana, and Oklahoma.

As a whole, the six sections of this curriculum address Myaamia history beginning with the pre-contact period (pre-1600s) and concluding with contemporary issues."

Teach Miami History is a wonderful source of lessons created by Miami people and are aligned with Indiana State Educational Standards that launched in 2013. Chapters One through Four focus specifically on grades three- five.

Teach Miami History can be accessed at: Home (teachmyaamiahistory.org)

2. The National Museum of American Indian in 2013 launched 'Native Knowledge 360' as a way to get Native voice and history into school across America. For those students in fifth grade that need more challenge, I would recommend the below link. While this connection point is not specific to Indiana, it does highlight environmental issues that are faced here in Indiana as well.

Leech Lake Ojibwe - Get Started (si.edu)

3. Indian Land Tenure Foundation is located in Minneapolis. The organization has made a push within the last five years to create lessons the bring Native knowledge into the classroom. A really great lesson which allows the student to understand how one action to the environment affects so many other life connections is a lesson on stewardship.

Tribal Resource Departments (lessonsofourland.org)

Corresponding activities page can be found here: A-Slice-of-Planet-Earth-Lesson-Plan-1.pdf (lessonsofourland.org)

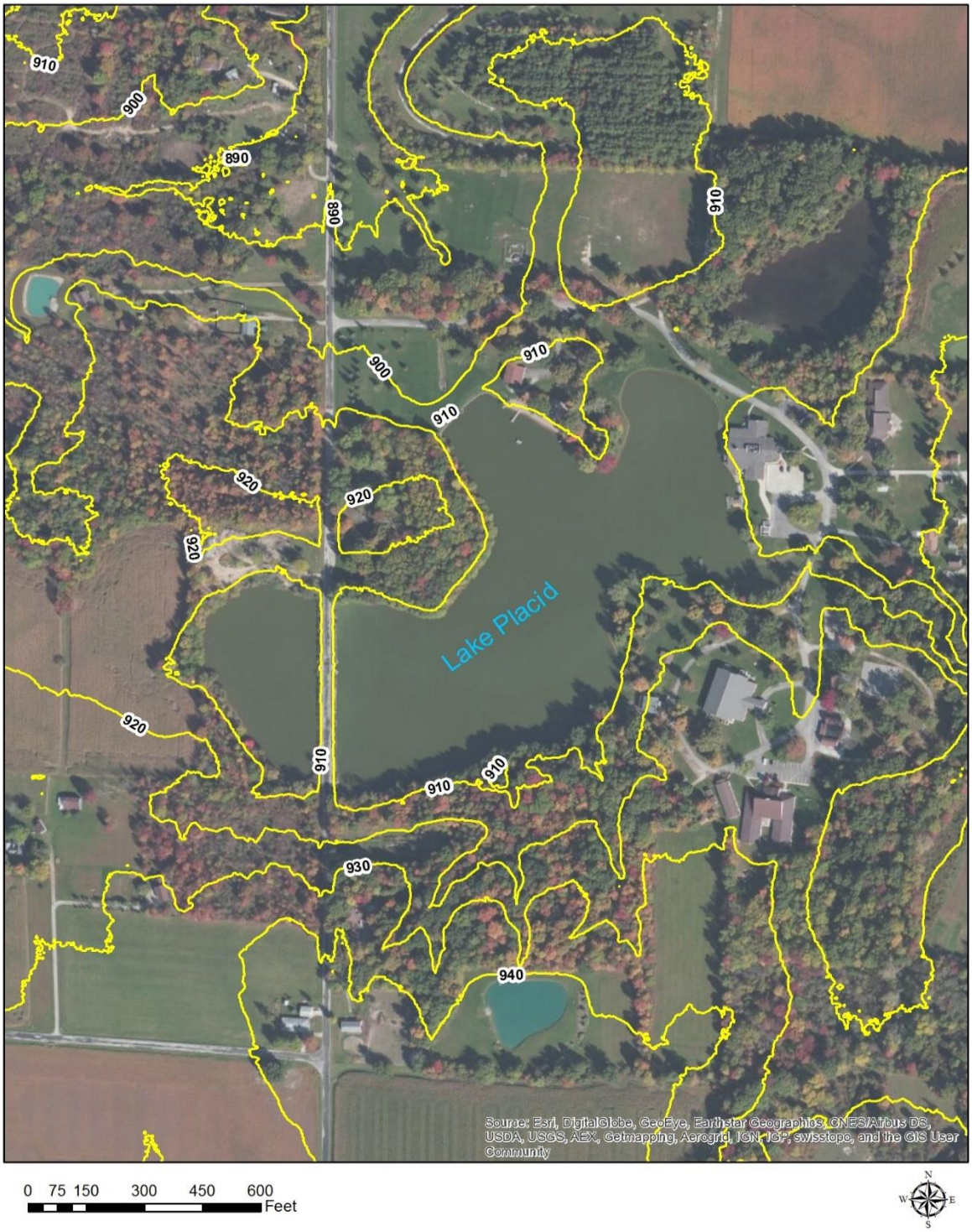
4. The Indiana Department of Natural Resources has created elementary lessons that correlate to some of the state parks in Indiana. Lessons three and four connect some of our state parks with history about the Native people that once lived on them.

These lessons can be accessed here: DNR: Hoosier History and Indiana State Parks

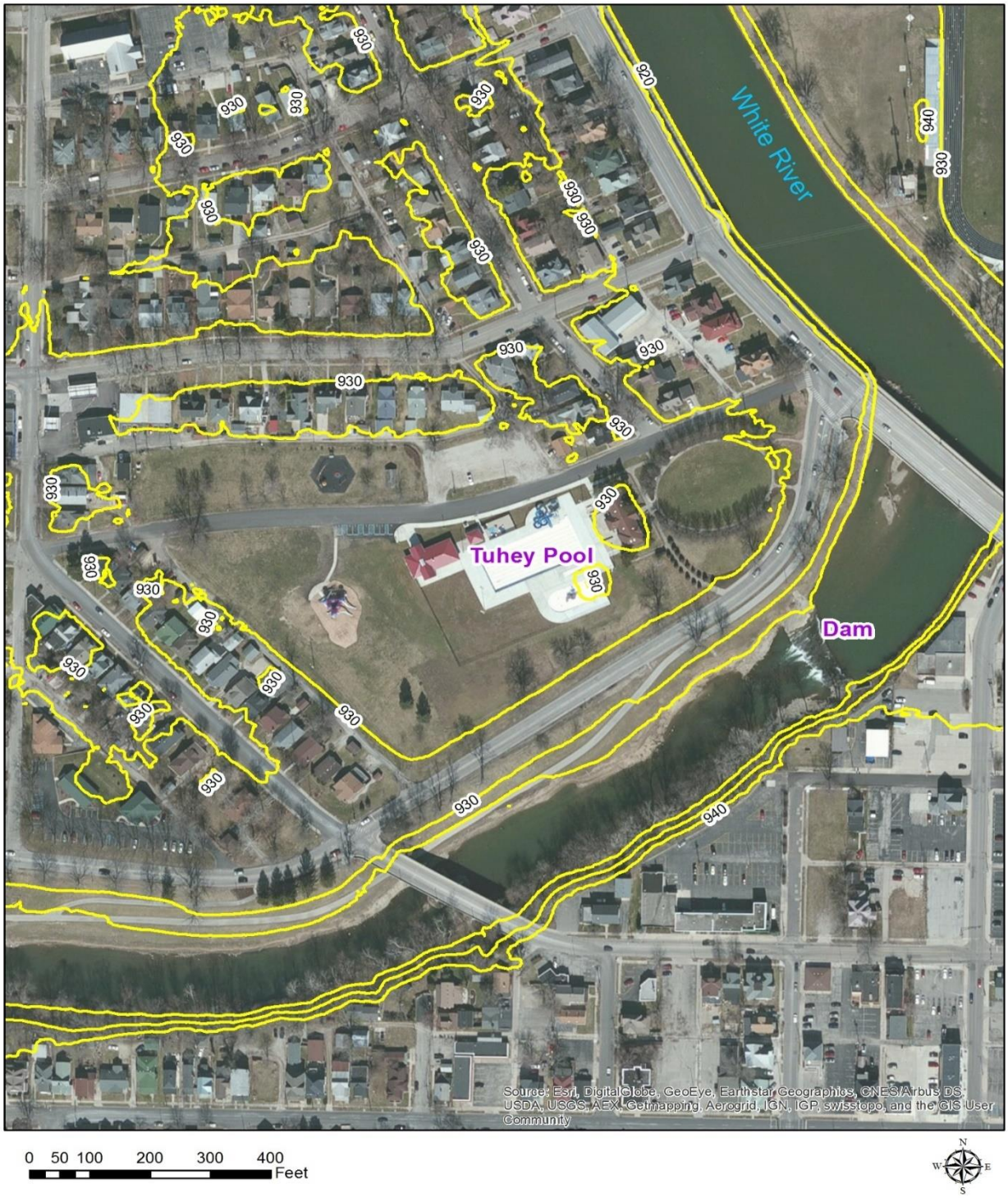
Appendix H: Lesson Packet Three

Map Use Ideas:

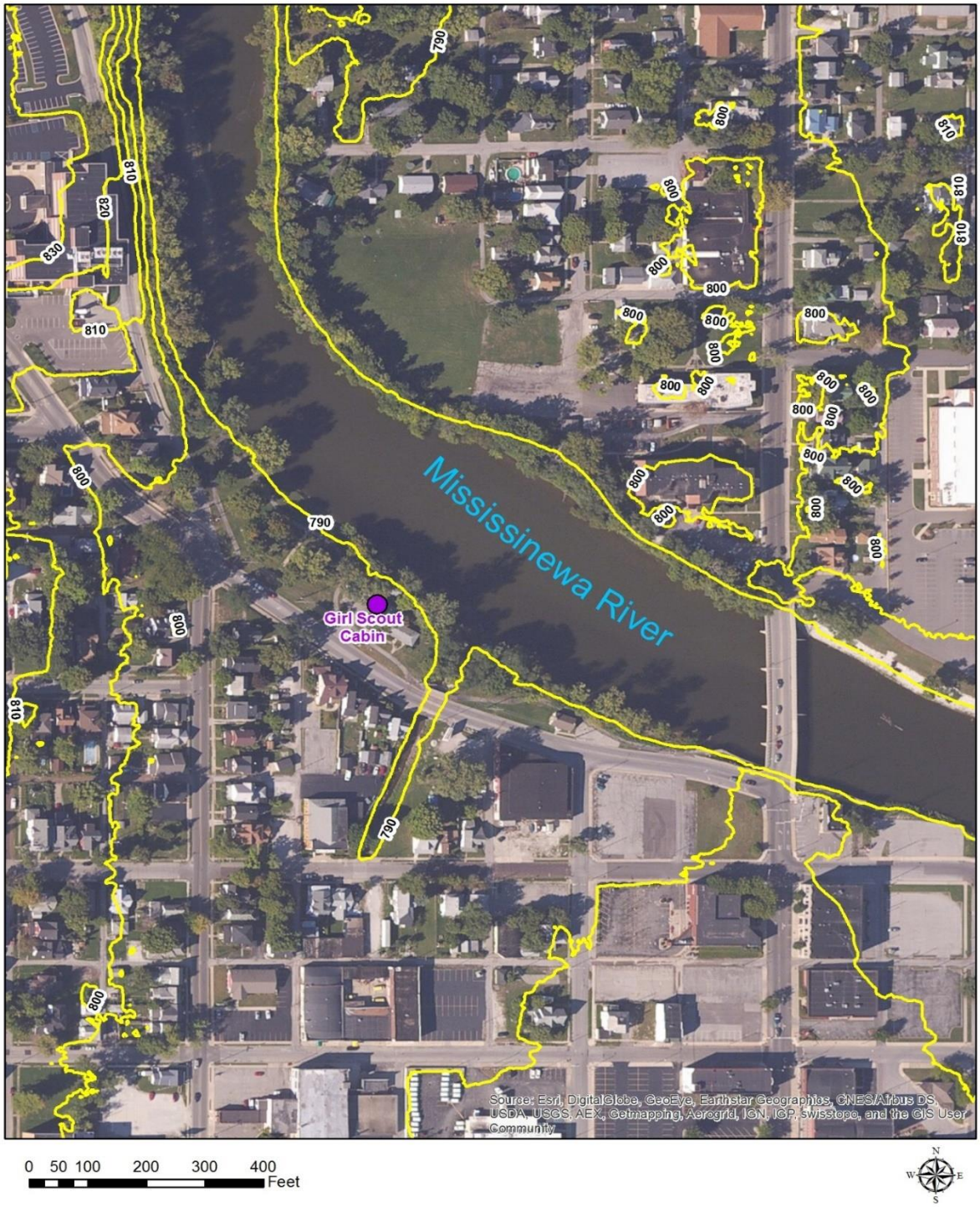
- Using Smartboards, place different points on the map and have students measure distances based on the distance key at the bottom of the map.
- Talk about changes in elevation…what does it mean to change elevations?
    - Point to a specific location and ask which way the water would flow? How did the student come to an answer?
- Discuss the land surrounding the water and how that land is used.
    - Talk about run-off of chemicals that could enter the water from city streets and parking lots. Include conversations about agricultural run-off.
    - Ask students to develop a list of ways to minimize pollutants entering the water.
- Students could write a story about a time they visited an area of the map or what they could do if they have not visited the area.
- Interview a local resident from the area and ask them about memories they have from visiting a site on the map.
    - How has the area changed?
- Discuss the watershed of the area located on the map.
    - How did the river or lake form?
    - What are the tributaries that feed into the river?
    - What body of water does the river empty into and so forth?
- Students could research the plants and animals of the area.
    - Do the animals live in this location year-round?
    - Which animals hibernate and/ or migrate?
    - What habitat does the animal need?
    - Are the same animals in this area year-round?
    - What trees and plants are here?
        - What do the plants need to survive?
        - Which animals use these plants and trees for food or shelter?
- Spend some time in class engineering boats to use on the river or lake and then build them in art class.



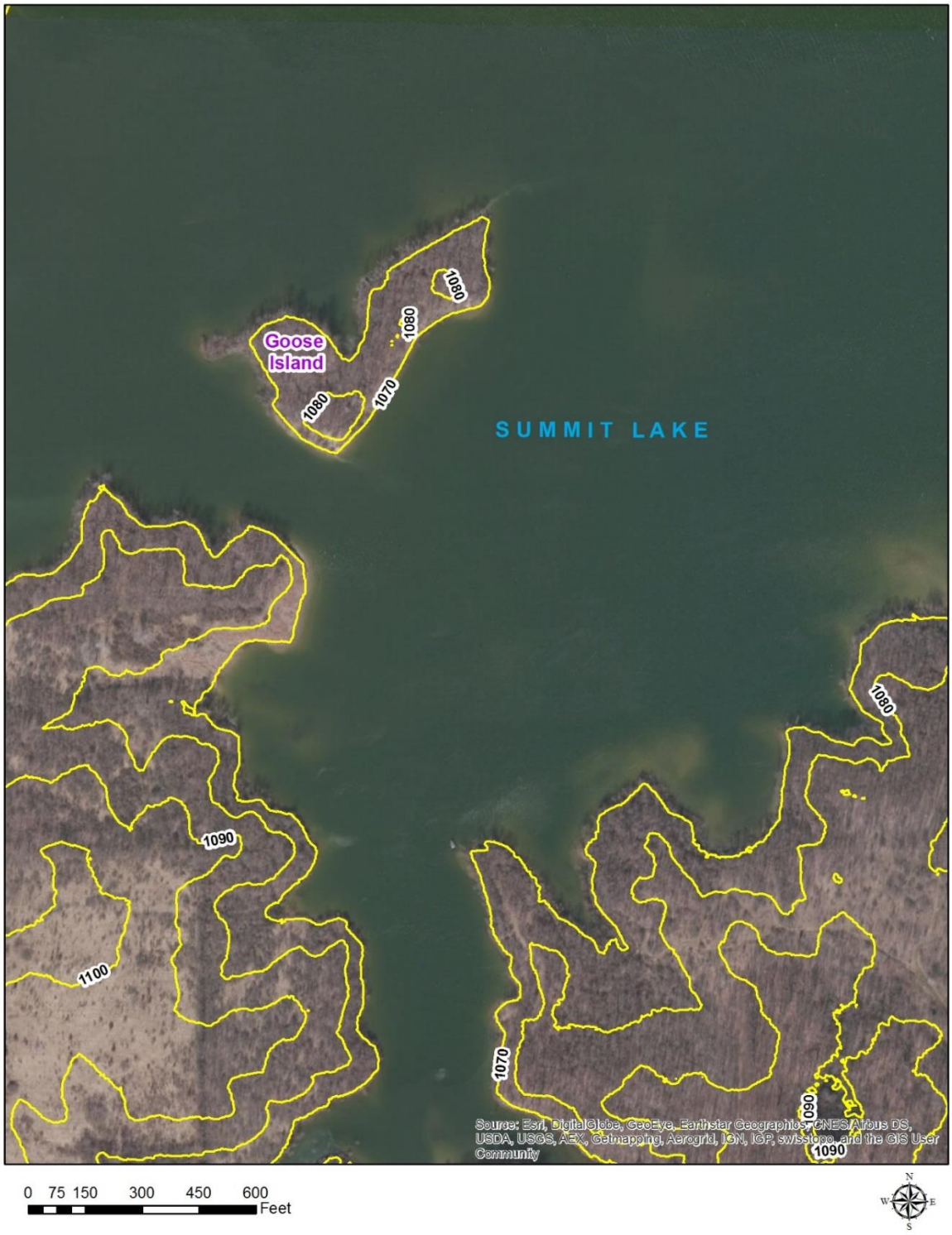
Hartford City, Blackford County



Muncie, Delaware County



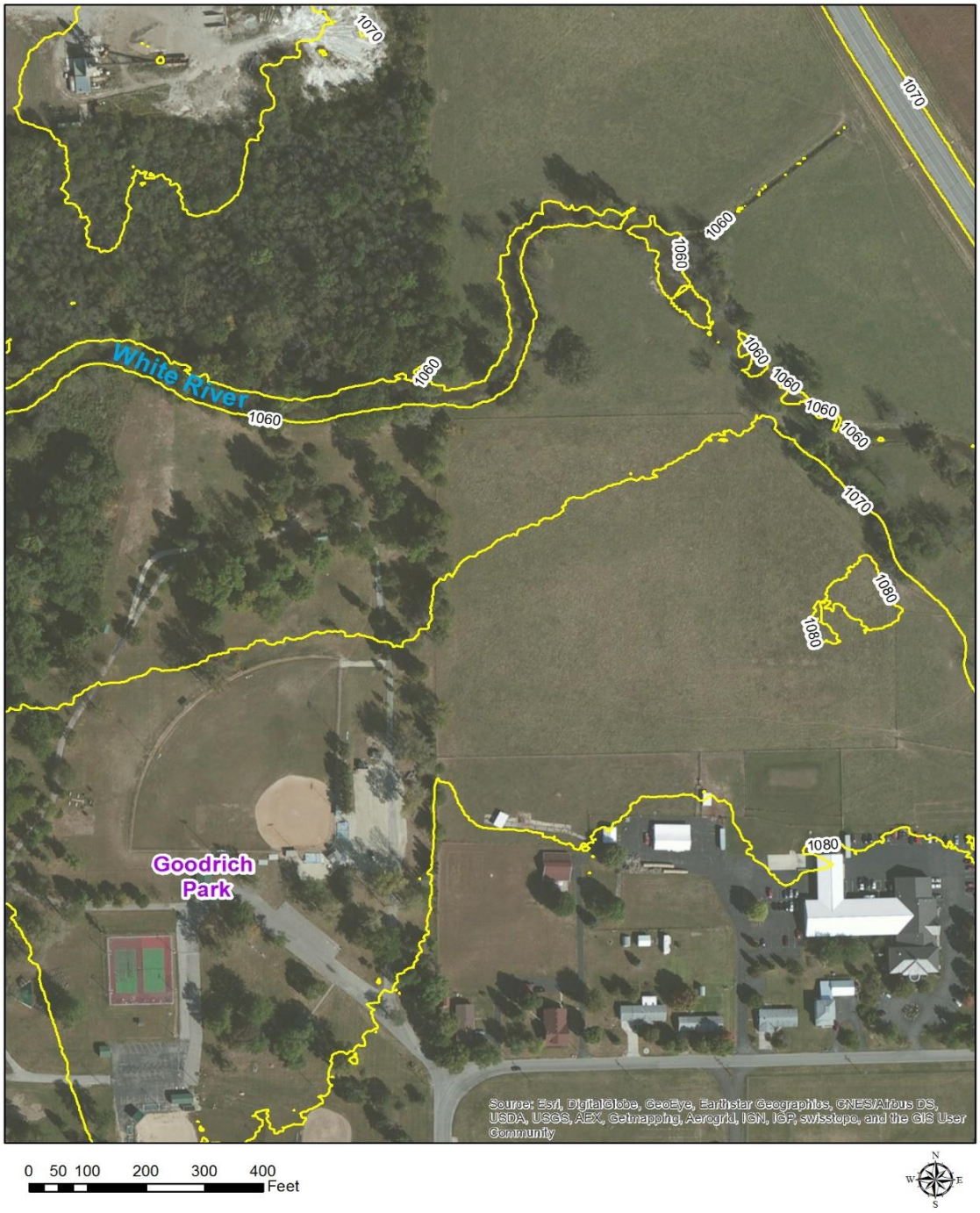
Marion, Grant County



New Castle, Henry County

Portland, Jay County

Anderson, Madison County



Winchester, Randolph County

Appendix I: Lesson Packet Two

Lesson Title: Food Choices and the Footprint Created

Duration: 1.5 hours
Subject: Sustainability
Setting: Inside
Grade Level: Advanced 4th and 5th
Vocabulary Terms: carbon footprint, sustainable, distribution center

Materials: Where Does Your Food Come From Handouts, Foodometer Handout, computer, and calculator (some teachers may want to omit calculator usage)

State Education Standards:
Science: SEPS.4; SEPS.5
Mathematics: 5.DS.2
Language Arts: 5.RV.1

Objectives:
1. Students will have a basic understanding of what a carbon footprint is.
2. Students will be able to think more about the processes that it takes to get food to the table.
3. An overarching theme is making better choices for the environment through food choices. *Helping to foster stewardship*

Summary: By participating in this lesson, students will be able to critically think about where foods they eat come from and use math skills to average food mileage distances and engage in critical dialogue about the role students have.

Background: An easy way to live more sustainably is to reduce our carbon footprint. Modern production of food has a large carbon footprint. Engaging in sustainable food systems is a great way to limit your impact on the earth.

Tons of food is thrown away every year, to reduce food waste, there are several simple strategies that can be used:
•Learn creative ways to use leftovers.
•Store food correctly to reduce the amount of spoilage.
•Shop wisely; only buy what you know can be consumed by your family within its use-by date.
•Create a menu ahead of time.

Introduction to Food Carbon Footprints: Class and group discussions
A food carbon footprint, or food print, are the greenhouse gas emissions produced by growing, rearing, farming, processing, transporting, storing, cooking, and disposing of the foods you eat.

- Begin by having a class discussion about foods and where they come from. Many times, students do not think about transportation from a supplier to distribution center and then on to the local grocery store.

- Split students up into groups and tell them to come up with other ways people, in Indiana, have access to foods. Possible answers could include gardens and farmer's markets.
- After group discussion, bring class back together to talk about one thing mentioned. Teachers can then talk about shopping locally, eating food that is in season, and growing your own food.

Shop Locally:
Fresh produce is purchased locally and can be purchased from farmers' markets. Locally grown food have greatly reduced food miles and doesn't need to be specially treated to have a long shelf life. A lot of locally produced food is also grown organically making the growing process better for the environment. Choose packaged products that are produced as close to where you live as possible to limit the miles it has to travel.

Eat Food that is in Season:
We have become used to being able to buy any type of fresh produce at any time of the year. Buying produce that is not in season means that the food has to travel long distances to get to you. Some produce does not last as long for example softer apples like macintosh versus harder apples like galas. Varieties have to be selected that have a long shelf life to allow for the length of time between picking and purchase. By eating food that is in season, you are saving on storage and freight costs.

Grow your Own Food:
Plant a vegetable garden to grow those foods that you can in your area. If you do not have a yard garden, use pots on a balcony or sunny windowsill. Engage in community garden plots. You cannot grow everything you eat but every little bit helps. (Many students, due to living arrangements, would not be able to have yard gardens but some might have heard of community garden plots.)

*Many of the counties in East Central Indiana have community garden plots.

- Give students hand-outs and have them individually work on the sheets.

References:

http://css.snre.umich.edu/css_doc/CSS09-05.pdf

***Lesson Adapted from** Carbon Footprint of the Food We Eat at Minnetrista Cultural Center, Muncie, IN*

Student Copy: Food print Overview Sheet

Shop Locally:
When products are produced or food is grown in a different part of the country, these products must be transported in order to be sold and consumed in your area. Additional fuel is used and carbon emissions released by transportation systems that bring in goods from other countries. Buying local goods can help reduce fuel usage and carbon emissions by eliminating the need for long mileage transport. Local farmer's markets are good sources of produce grown in the area.

Eating Habits:
By changing your eating habits, you can reduce carbon emissions. Helping cook meals at home helps eliminate trips to fast food establishments and restaurants. You can grow some of your own food at home by creating a garden. Eating home-grown food also eliminates the need for transportation to get your food to you.

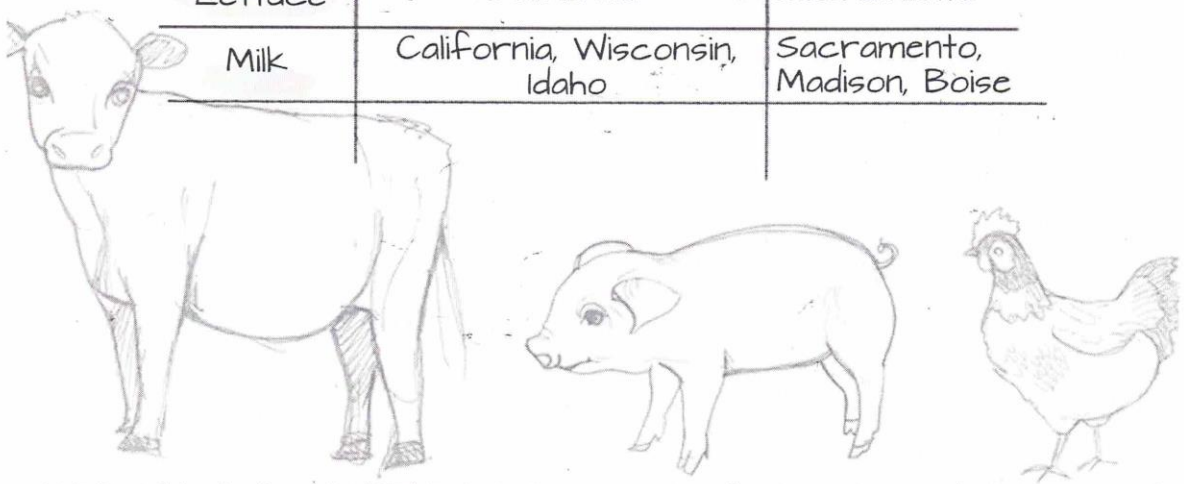
A Bulk Solution:
Buying drinks and snacks in bulk and taking them to school in reusable containers is a way to reduce waste.

BYOB:
Bring your own bags! You can decorate reusable shopping bags. Replace paper bags with a lunch box to decrease the amount of paper sacks needed for lunch. Reducing the amount of paper sacks for lunch will mean that less trees will be used.

Where Does Your Food Come From?

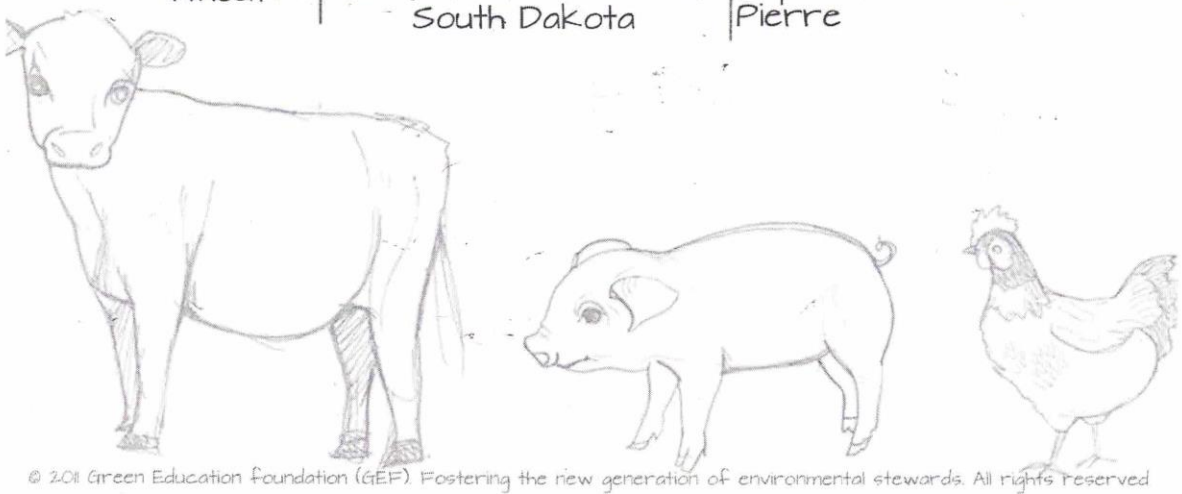
Ever wonder where your food comes from? The average distance a single food item travels from the farm to your table is 1500 miles. That's like driving from Boston, Massachusetts to Omaha, Nebraska! Listed below are a selection of common produce found in super markets, and the top states that produce them.

Produce	State	Capital City
Apples	Washington, New York, Michigan	Olympia, Albany, Lansing
Bananas	Hawaii, Florida	Honolulu, Tallahassee
Beef	Texas, Nebraska, Kansas	Austin, Lincoln, Topeka
Broccoli	California, Arizona	Sacramento, Phoenix
Butter	California, Wisconsin, Pennsylvania	Sacramento, Madison, Harrisburg
Carrots	California, Texas, Florida	Sacramento, Austin, Tallahassee
Cheese	Wisconsin, California, Idaho	Madison, Sacramento, Boise
Chicken	Georgia, Arkansas, Alabama	Atlanta, Little Rock, Montgomery
Corn	Iowa, Illinois	Des Moines, Springfield
Grapes	California, Washington, Oregon	Sacramento, Olympia, Salem
Lettuce	California	Sacramento
Milk	California, Wisconsin, Idaho	Sacramento, Madison, Boise



Where Does Your Food Come From?

Produce	State	Capital City
Oats	Wisconsin, Minnesota, South Dakota	Madison, Saint Paul, Pierre
Onions	California, Oregon, Idaho	Sacramento, Salem, Boise
Oranges	Florida, California	Tallahassee, Sacramento
Peanuts	Georgia	Atlanta
Peas	North Dakota, South Dakota, Montana	Bismarck, Pierre, Helena
Pineapples	Hawaii	Honolulu
Pork	Iowa, North Carolina, Minnesota	Des Moines, Raleigh, Saint Paul
Potatoes	Idaho, Washington, Wisconsin	Boise, Seattle, Madison
Rice	Arkansas, California, Louisiana	Little rock, Sacramento, Baton Rouge
Sweet Potatoes	North Carolina, California, Mississippi	Raleigh, Sacramento, Jackson
Tomatoes	California, Florida	Sacramento, Tallahassee
Turkey	North Carolina	Raleigh
Wheat	Kansas, North Dakota, South Dakota	Topeka, Bismarck, Pierre



Calculating Your Foodometer

How far does your food travel? Choose five food items from the "Where Does Your Food Come From" worksheet. Using a map, calculate the distance from your hometown, to the capital city of the state that produces your chosen food item. Use the table below to record you data findings, and then answer the questions below.

	Food Item	Location	Distance Traveled
1.			
2.			
3.			
4.			
			Total:

Directions: Use the data to answer the questions below. Be sure to include your calculations below each answer.

1. What is the total distance your food traveled? _____

2. What is the average distance your food traveled? _____

3. What is the shortest distance one of your items of food traveled? _____

4. What is the farthest distance one of your items traveled? _____

Environmental Revitalization

Lesson: The Changing Landscape

Duration: Several sessions
Subject: Social Studies and Science
Setting: Inside
Grade level: Fourth and Fifth

Vocabulary Terms: urbanization, restoration, pesticide, herbicide, endangered, threatened, rare, floodplain, deforestation

State Education Standards:
Social Studies: 4.1.9, 4.1.15, 4.2.7; 5.1.20, 5.2.10, 5.4.4
Science: 4. ESS.4; 5. ESS.3
Language Arts: 4.SL.4.2; 5.W.3.2

Objectives:
1. Students will be able to critically examine how increased urbanization impacts animals and plants.
2. Students will learn about current, Indiana specific, nature restoration projects.
3. Students can distinguish between man-made and natural structures.

Materials: Six Place Characteristics handouts

Summary: By participating in this lesson, students will be able to understand land changes that alter plant and animal communities while also grasping an understanding of mitigation strategies and current projects underway.

Background: Historically, Indiana had 19,500,000 acres of forest today, we have just over 4.7 million acres of forest. Based on approximation, 85 percent of wetlands have been lost due to draining the land for agriculture.

Wetlands are important for many reasons:
- Flood Control: During heavy rains, wetlands slow the amount of water rushing into rivers from surrounding surfaces.
- Water quality: Wetland plants have extensive roots that help filter out pesticides and herbicides.
- Wildlife: Many fish species are dependent on wetlands as spawning sites. Animals like muskrat and beaver are totally dependent on wetlands to provide food and shelter. Many birds, migratory birds included use wetlands for nesting.
- "So many wetlands have been lost or degraded, there are more than 120 species of wetland plants in Indiana that are endangered, threatened, or rare."
- Wetland plants also help stabilize our shorelines and keep soils from falling into rivers.

In 1901, the Indiana Forestry Board was created due to the overwhelming loss of forests. The forestry board set aside many areas of Indiana that became state forests. While the state forests were very much needed, the damage to wildlife hand already occurred. Due to fragmenting of forested areas, animals were now faced with crossing dangerous roads to get from one forested area to another. Also, due to fragmentation, invasive plant species were able to grow along edge habitat thus competing with our native plant species.

Changing Landscape Handouts: Allow students to compare the first two handouts and talk about changes that have occurred. Ask students to name the changes from the first handout. Talk about the land being cleared for farming and that less wildlife is visible.

Show handout three and encourage students to think about changes brought on by growth of a settlement. Talk about how increased growth has led to less natural areas and less wildlife. Where did the wildlife go? In search of other areas with sources of food and safety.

Show handout "The Flood" and ask why the area flooded. Flooding is a natural process that happened because the settlement was built in a floodplain or that by removing more plants, the roots needed for stabilizing the shoreline was absent causing the edge to collapse into the river.

Continue with the handout "Rebuilt City." Ask students to identify new changes in the landscape. How has land use changed compared to before the flood?

Handout "Modern City" Ask students to identify what ways the city has been built more and the natural landscape altered more. Ask questions like, As human activity increases, how does that change the natural landscape.

Review: Go back through the handouts and highlight the changes to the natural environment and how that impacted the plant and animal populations. *It is altered to accommodate human needs by removing trees and other natural vegetation. Changing the rivers' natural flow to a man-made flow to try and reduce flooding. As a result of these changes, wildlife in the area are reduced or eliminated. Artificial systems must be installed to drain excess water from land that was previously wetlands.*

Ask students to write about how they are feeling after the review.

*It is important to teach students about revitalization projects as too much doom and gloom make students feel defeated.

Revitalization Projects:

After several decades of deforestation and the loss of wetlands, many groups of people came together to help restore wetlands and protect more areas of forest.

Indiana wetland restoration groups:

- Audubon of the Great Lakes- They are working on restoring wetlands in Northwest Indiana to help the decline of wetland birds.
- Michigan City, IN are working to restore wetlands to help stabilize shorelines and decrease soil erosion.
- Little River Wetlands Project restores and protects wetlands along the Little River, a tributary of the Wabash River.
- Muncie, IN restored an abandoned industrial site into a wetland preserve as a way to clean up the environment.
- Goshen College reclaimed abandoned agriculture fields and through several years returned the area back into wetland habitat.
- Additional groups are working on restoring wetlands near Indianapolis.

Indiana Land Trusts Protecting Natural Areas:

- ACRES Land Trust
- Central Indiana Land Trust
- Indiana Karst Conservancy
- NICHES Land Conservancy
- Red-Tail Land Conservancy, Inc.
- Shirley Heinz Land Trust
- Sycamore Land Trust
- The Nature Conservancy

I am certain other groups exist but those are the well-known groups.

Student Engagement:

Split students into groups to work on a research project about a wetland plant or animal or species of trees found in Indiana Forests. Incorporate drawings, written paper component, charts, and any other means of presenting findings. Allow students to share reports in the school newspaper or through some other means.

Research Red-tail Nature Conservancy, Inc to gain a better understanding of how a conservancy operates.

Providing Closure:

Our class began this project learning about Indiana natural history and habitat loss, then we compared changing landscapes to understand how urbanization impacts natural areas. Time was given for individual reflection. We then learned that many groups are helping restore wetlands and protect natural areas. Research projects culminated this experience and we shared our findings with others.

Extension:

The Changing Landscape can turn into a semester or year-long lesson. This lesson sets a foundation that could spawn many new activities based on teacher and student interest.

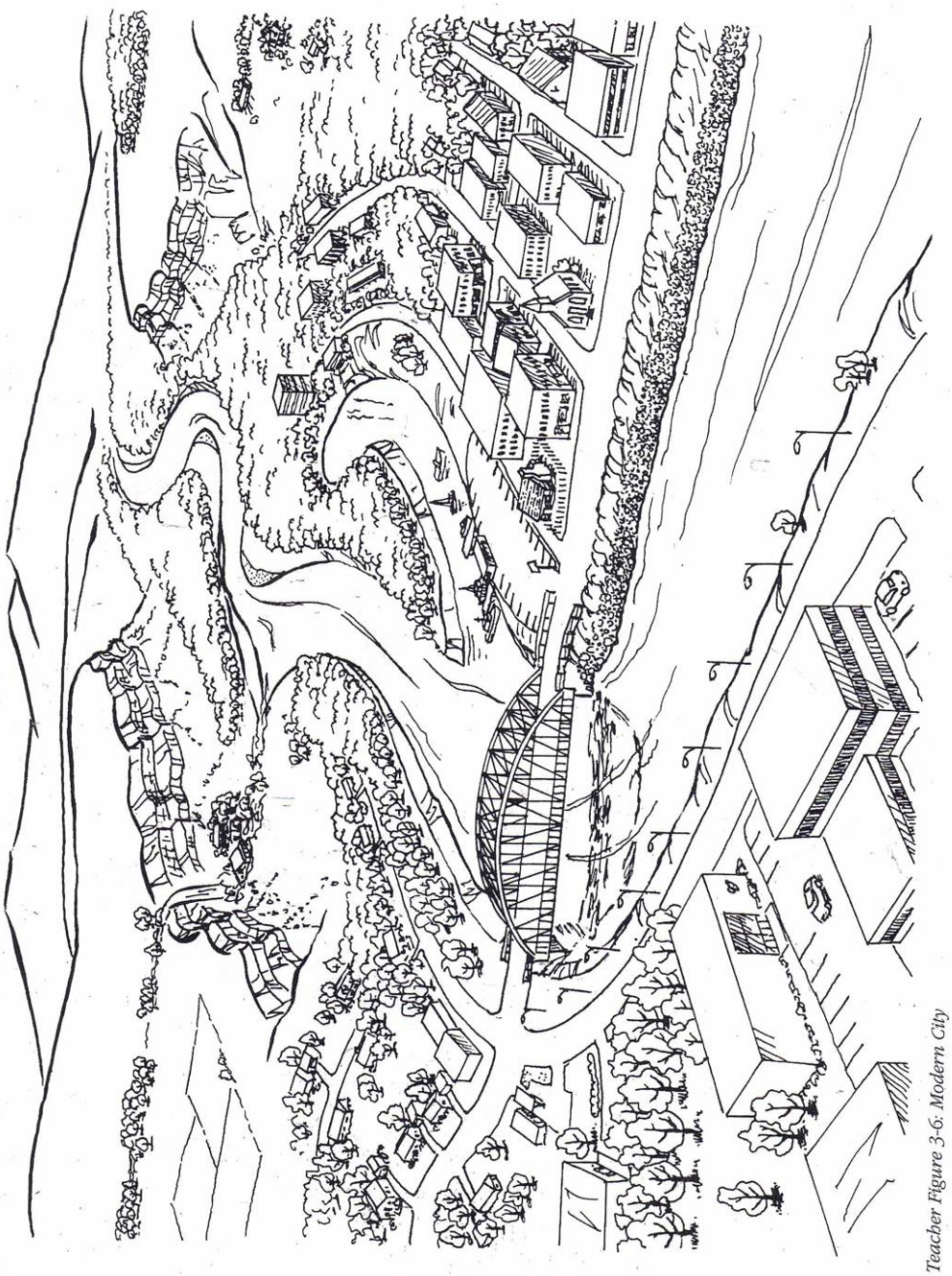
References used for background content:

Indiana forest management history and practices (fs.fed.us)

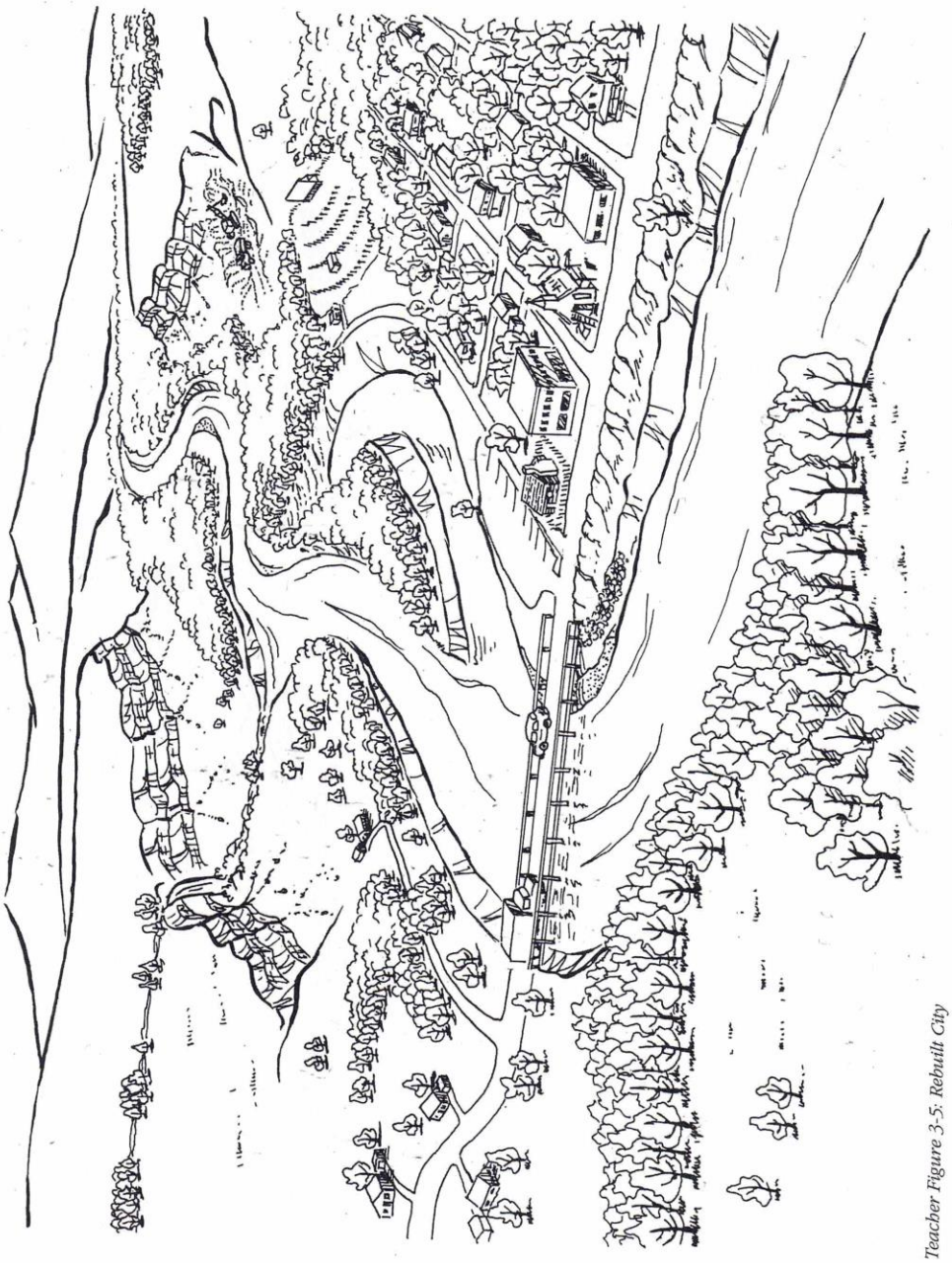
DNR: Indiana Forest Facts

InWetConPlan (csu.edu)

Changing Landscape handouts and guided questions were part of an existing curriculum and I give credit to whomever created them as the source is unknown.



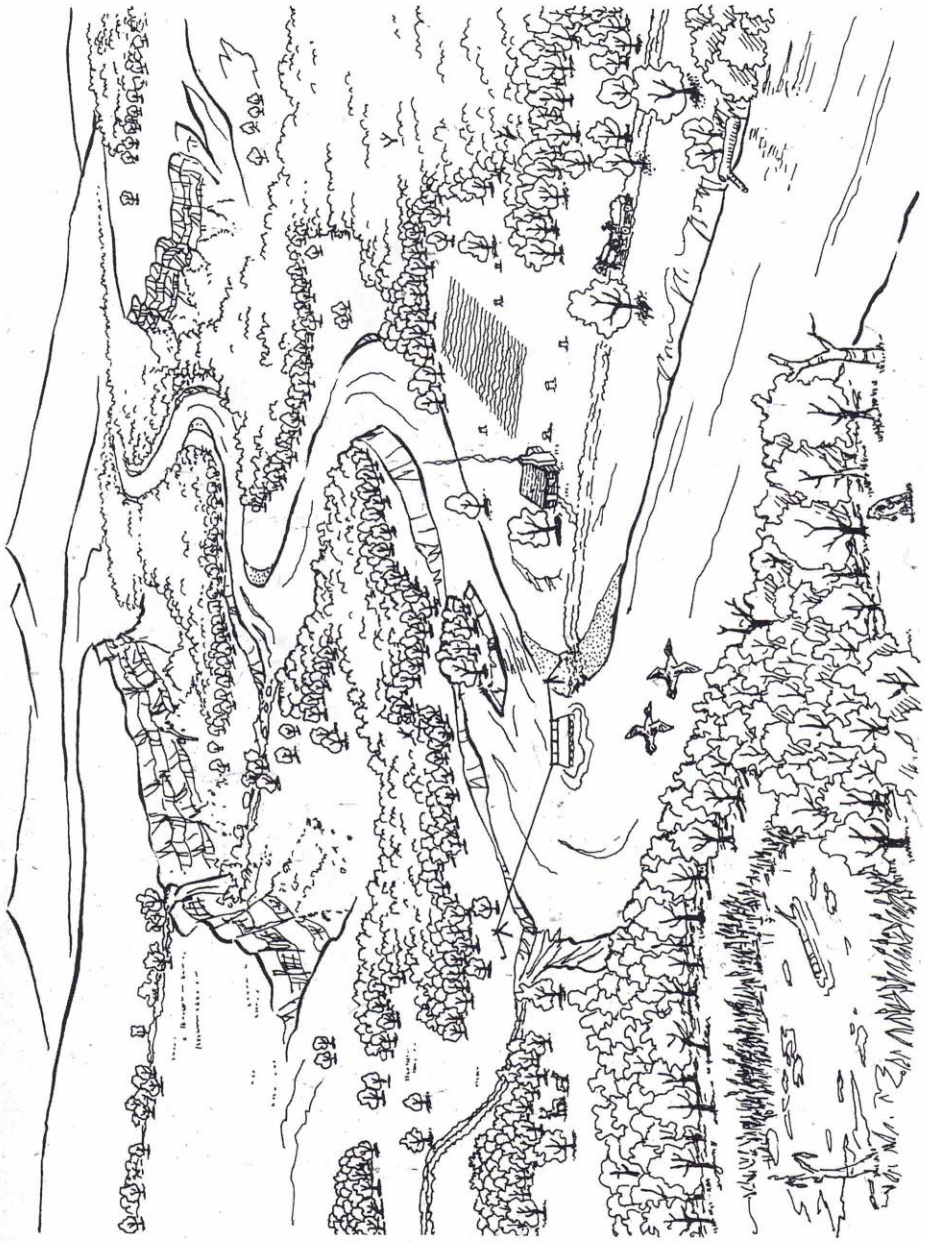
Teacher Figure 3-6: Modern City



Teacher Figure 3-5: Rebuilt City

Teacher Figure 3-4: Flood

Teacher Figure 3-3: Growth of the Settlement



Teacher Figure 3-2: Early Settlement

Teacher Figure 3-1: The Natural Landscape